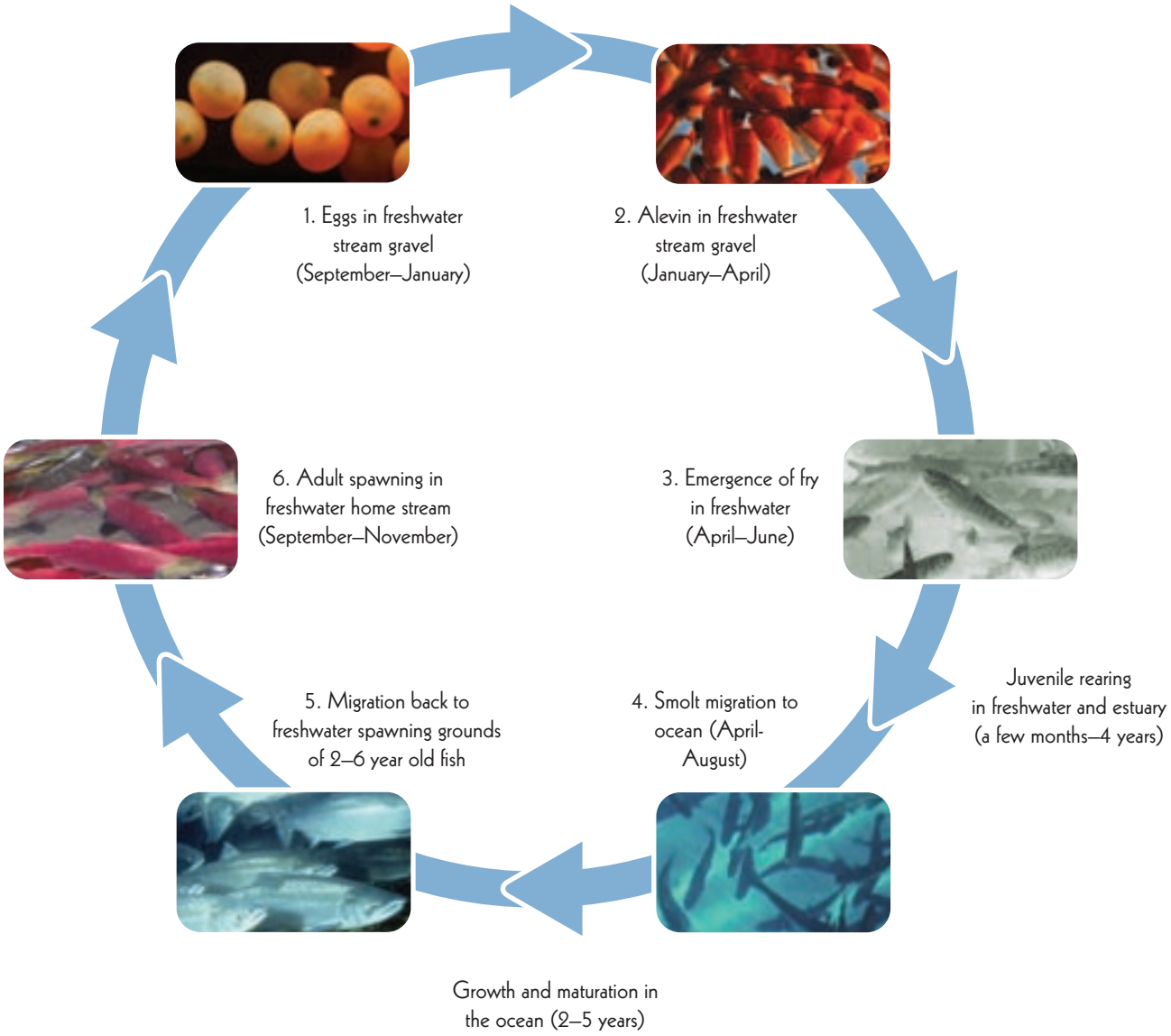
2005 Report to Congress

Pacific Coastal Salmon Recovery Fund

FY 2000–2004

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

The Life Cycle of Pacific Salmon



Notes:

- Timing and length of any given stage vary among species of salmon (e.g., Chinook, sockeye, etc.)
- Timing is depicted for fall runs (e.g., spawn in fall, eggs hatch in spring)—reversed for spring runs
- Estuaries provide a mix of freshwater and saltwater
- Adults die after spawning; deteriorating carcasses provide essential nutrients to stream
- Disturbances at any stage can impact survival (e.g., obstructions to migration, floods, drought)

Photo credits:

- *1, 2, and 5—courtesy of Alaska Department of Fish & Game*
- *3 and 6—courtesy of Northwest Indian Fisheries Commission*

2005 Report to Congress

Pacific Coastal Salmon Recovery Fund
FY 2000–2004

July 2005

Copies of this report may be obtained by contacting:

NOAA National Marine Fisheries Service
Northwest Region
7600 Sandpoint Way NE
Seattle, WA 98115

An online version of this report is available at http://www.nwr.noaa.gov/pcsrf/2005_PCSRF_Report.htm.

Table of Contents

Executive Summary i

Chapter 1: Introduction 1

- Background 1
- Salmon Conservation and Recovery 1
- PCSRF Performance Goals and Measures 2
- Distribution of Funding for Salmon Conservation and Recovery 3
- Report Organization 4

Chapter 2: Status and Recovery of Listed Salmon Populations 5

- Recovery Domains 5
- Major Factors Limiting Recovery 5
- Recovery Planning 26

Chapter 3: Pacific Coastal Salmon Recovery Fund Performance 27

- Progress Toward Performance Goals 27
- Next Steps 30

Chapter 4: State and Tribal Efforts 31

- Washington 31
- Oregon 34
- California 36
- Idaho 40
- Alaska 42
- Columbia River Tribes 46
- Pacific Coastal Tribes 48

Chapter 5: Conclusions 51

Table of Exhibits

The Life Cycle of Pacific Salmon ..... inside front cover

Exhibit 1-1: Congressional Appropriation of PCSRF Funds 1

Exhibit 1-2: Performance Goals and Measures for PCSRF.....2

Exhibit 1-3: PCSRF and State Matching Funds for Salmon Recovery in Washington, Oregon, and California, FY 2000–03.....3

Exhibit 2-1. Distribution of Salmon ESUs 6

Exhibit 2-2. Puget Sound Recovery Domain 7

Exhibit 2-3. Willamette/Lower Columbia Recovery Domain.....9

Exhibit 2-4. Interior Columbia Recovery Domain.....12

Exhibit 2-5. Oregon Coast Recovery Domain.....16

Exhibit 2-6. Southern Oregon/Northern California Coast Recovery Domain 18

Exhibit 2-7. North-Central California Coast Recovery Domain 20

Exhibit 2-8. Central Valley Recovery Domain 22

Exhibit 2-9. South-Central/Southern California Coast Recovery Domain 24

Exhibit 3-1: Progress in Performance Goals.....28

Exhibit 4-1: Washington's Distribution of PCSRF and State Funds, FY 2000–2004 31

Exhibit 4-2: Washington PCSRF Funds Distribution Timeline 32

Exhibit 4-3: Location of State and Tribal PCSRF Projects in Washington.....33

Exhibit 4-4: Oregon's Distribution of PCSRF and State Funds, FY 2000–2004 34

Exhibit 4-5: Oregon PCSRF Funds Distribution Timeline 35

Exhibit 4-6: Location of State and Tribal PCSRF Projects in Oregon.....35

Exhibit 4-7: California's Distribution of PCSRF and State Funds, FY 2000–2003.....38

Exhibit 4-8: California PCSRF Funds Distribution Timeline 38

Exhibit 4-9: Location of State and Tribal PCSRF Projects in California.....39

Exhibit 4-10: Idaho FY 2004 and FY 2005 (Proposed) Funding Distribution Timeline 40

Exhibit 4-11: Location of State and Tribal PCSRF Projects in Idaho.....41

Exhibit 4-12: Alaska's Distribution of PCSRF and State Funds, FY 2000–2004 44

Exhibit 4-13: Alaska PCSRF Funds Distribution Timeline 44

Exhibit 4-14: Distribution of State PCSRF Projects in Alaska.....45

Exhibit 4-15: Columbia River Tribes' Distribution of PCSRF Funds, FY 2000–2004 46

Exhibit 4-16: CRITFC PCSRF Funds Distribution Timeline.....47

Exhibit 4-17: Pacific Coastal Tribes' Distribution of PCSRF Funds, FY 2000–2004 48

Exhibit 4-18: NWIFC PCSRF Funds Distribution Timeline 49

Exhibit 5-1: Distribution of PCSRF Projects Throughout the Region 50

Exhibit 5-2: PCSRF and State Funds Committed by Category 51

Recovery Domains and Evolutionarily Significant Units..... inside back cover

Executive Summary

"I was pleased to see the incredible care that goes into protecting the salmon that journey up the river. It's an important message to send to people, it seems like to me, that a flourishing salmon population is a vital part of the vibrancy of this incredibly beautiful part of our country. And I appreciate the commitment that we are making as a country, and that you're making as a community, for salmon restoration. What I saw was, and what you know, firsthand, is that we can have good, clean hydroelectric power and salmon restoration going on at the same time."
— George W. Bush, August 22, 2003

Over five years, including FY2006, President Bush requested $470 million for the Pacific Coastal Salmon Recovery Fund to support local, state, and tribal salmon habitat restoration projects in Washington, Oregon, California, Alaska, and Idaho. In the last four years, through FY 2005, Congress has appropriated $376.65 million.

This annual report to Congress on the Pacific Coastal Salmon Recovery Fund (PCSRF) provides information on PCSRF accomplishments through December 2004, recent performance measures for the PCSRF and progress to date on those measures, and an identification and assessment of recovery needs for salmon and steelhead listed under the Endangered Species Act (ESA) as requested in the Conference Report accompanying the Consolidated Appropriations Act, 2005 (H Rept 108-792).

The PCSRF was established by Congress in fiscal year (FY) 2000 to contribute to the conservation, restoration, and sustainability of Pacific salmon populations and their habitats. Congressional appropriations for PCSRF have been made for the States of Washington, Oregon, California, Idaho, and Alaska and to Pacific Coast and Columbia River tribes. After receiving PCSRF funding from the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS), the states and tribal commissions use separate, competitive processes for distributing their funds in accordance with memoranda of understanding with NMFS for salmon recovery and conservation projects to local governments, individual tribes, public partnerships, watershed councils, soil and water conservation districts, and other organizations and entities. PCSRF has also played an important role in leveraging additional funding and volunteer participation in salmon recovery from local and private sources.

The states and tribes have used PCSRF to protect and restore salmon habitat, conduct watershed assessments to determine factors limiting salmon productivity, develop plans to address limiting factors, develop resource management plans, conduct salmon enhancement and supplementation activities, monitor and evaluate recovery actions and outcomes, and conduct research and monitoring on salmon populations. Over 4,000 PCSRF projects have been funded to date, including over 1,800 habitat restoration projects and over 1,100 planning and assessment projects.

Performance goals and measures for PCSRF were recently developed. PCSRF activities support three performance goals: (1) increase naturally spawning Pacific salmon populations to levels that are sustainable and allow for annual harvests; (2) enhance the availability of habitat to support sustainable Pacific salmon populations; and (3) improve knowledge and management

practices and the local capacity to implement management practices to sustain salmon populations. For each performance goal, the PCSRF program has set performance measures and indicators for tracking and reporting on progress. This report provides an accounting of progress on these performance measures through 2004. For example, PCSRF project data show that over 3,000 miles of stream habitat have been restored and over 3,500 fish passage blockages removed to enhance the availability of habitat necessary to support sustainable salmon populations. Also, increases in population numbers over the past 5 years have been shown in 16 of the Pacific salmon and steelhead evolutionarily significant units (ESUs).

Pacific salmon and steelhead ESUs on the west coast have been grouped into geographic recovery domains, which allows for an ecosystem approach to identifying the recovery needs and actions necessary for multiple ESUs in an area. Draft recovery plans are expected in 2005 for several recovery domains. Major factors limiting recovery for each ESU and activities underway to address recovery needs in the domains are described in this report.

PCSRF is making important contributions to systematic and cumulative efforts to improve the quality of salmon habitat, increase knowledge about salmon and steelhead life cycles and requirements, and prioritize conservation and recovery actions. There are signs of increased salmon abundance in some areas and PCSRF projects are improving the quality of salmon habitat in streams and watersheds across the region.

Chapter 1: Introduction

Background

The Pacific Coastal Salmon Recovery Fund (PCSRF) supports the conservation and recovery of Pacific salmon across the rivers, watersheds, and coastal areas they inhabit in Washington, Oregon, California, Alaska, and Idaho. PCSRF was established by Congress in Public Law 106-113 in response to the listings of Pacific salmon and steelhead populations under the Endangered Species Act (ESA) in the 1990s, as well as the impacts of the 1999 Pacific Salmon Treaty Agreement. Since fiscal year (FY) 2000, PCSRF has been used by state, local, and tribal entities to restore and protect salmon habitat; conduct watershed assessments; develop local plans for restoration efforts and management; enhance salmon populations; educate constituencies; and conduct research to monitor, evaluate, and support salmon conservation and recovery.

PCSRF supplements and complements existing federal, state, and tribal programs to conserve and restore Pacific salmon and steelhead. By working in conjunction with these programs, PCSRF leverages the capabilities, expertise, and information of multiple entities, while improving the effectiveness of salmon recovery efforts overall. The National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) oversees the administration of PCSRF and distributes the congressional appropriations to states and tribes in the Pacific Coast region. Congressional appropriations for FY 2000–2005 are shown in Exhibit 1-1.[1] Idaho was added to the PCSRF program in FY 2004.

Salmon Conservation and Recovery

Pacific salmon and steelhead (referred to generically in this report as "salmon") are anadromous fish that spawn and rear in freshwater but spend much of their adult life in the ocean (see the salmon life cycle diagram on the inside front cover of this report). Their habitat ranges

[1] Authorization for appropriations through FY 2003 was provided in the FY 2001 Appropriations Act (P.L. 106-553). Congress authorized the FY 2004 appropriation in P.L. 108-199 and the FY 2005 appropriation in P.L. 108-447. The amounts in Exhibit 1-1 are net of recessions and other reductions.

Exhibit 1-1: Congressional Appropriation of PCSRF Funds (in millions)

	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Washington	$18.0	$30.2	$34.0	$27.8	$26.0	$24.6
Alaska	$14.0	$19.5	$27.0	$21.9	$20.6	$23.2*
California	$9.0	$15.1	$17.0	$13.9	$13.0	$12.8
Oregon	$9.0	$15.1	$17.0	$13.9	$13.0	$12.8
Idaho	•	•	•	•	$4.9	$4.4
Pacific Coastal Tribes	$6.0	$7.4	$11.0	$8.9	$8.4	$7.9
Columbia River Tribes	$2.0	$2.5	$4.0	$3.0	$3.1	$2.5
Total	$58.0	$89.8	$110.0	$89.4	$89.0	$88.2*

* Does not include $500,000 (pre-recession) that Congress transferred to a fishing capacity reduction program for the Southeast Alaska purse seine fishery.

from the inland watersheds draining into the Pacific Coastal region's rivers and streams, through coastal estuaries, to the Pacific Ocean. Because salmon return to spawn in their birth stream, species have evolved over time based on geography and other factors into genetically distinct populations called evolutionarily significant units (ESUs). There are 52 salmon ESUs on the Pacific Coast (not including Alaska), of which 26 ESUs are currently listed as threatened or endangered under the ESA. A map showing the ESU designations can be found on the inside back cover of this report.

Many factors—both human-caused and natural—have contributed to the decline of salmon over the past century. Salmon habitat has been altered through activities such as urban development, logging, grazing, power generation, and agriculture. These habitat alterations have resulted in the loss of important spawning and rearing habitat. Past harvest and hatchery practices and other factors also affected salmon abundance and left populations more susceptible to fluctuations in the natural environment, such as changing ocean conditions, droughts, fires, and floods. Many of these activities and conditions continue to threaten salmon and their habitat, even as programs such as PCSRF seek to restore endangered and threatened salmon ESUs and prevent other salmon from becoming threatened with extinction.

Recovery of sustainable salmon populations requires an ongoing commitment over many salmon life cycles. The actual benefits of restoration efforts can take years to realize due to the significant time lag from investment to physical habitat changes and biological response. This time lag makes it all the more important to ensure that investments in salmon conservation and recovery are used to address the highest priority needs and that the effectiveness of recovery actions is monitored and evaluated over time. Accordingly, PCSRF supports watershed assessments and other planning efforts to identify and address the key factors that limit salmon recovery (called "limiting factors") for different ESUs and to identify and prioritize recovery actions based on those factors. Other PCSRF projects monitor the health and status of watersheds and salmon stocks, providing information needed to evaluate whether habitat restoration projects and other recovery actions are appropriate and effective.

PCSRF Performance Goals and Measures

The strategic goal of PCSRF is to contribute to the conservation, restoration, and sustainability of Pacific salmon populations and their habitats. This goal will be accomplished by maintaining or increasing salmon habitat, developing plans and assessments on recovery and conservation needs, enhancing salmon stocks where appropriate, monitoring and evaluating recovery efforts, educating constituencies, and conducting research on salmon populations and factors affecting productivity.

NMFS has worked with its state and tribal partners to establish a set of performance goals and measures to more effectively evaluate and report on progress toward

Exhibit 1-2: Performance Goals and Measures for PCSRF

Measure Type	Performance Goal	Performance Measure
Outcome	Increase naturally spawning Pacific salmon populations to levels that are sustainable and allow for annual harvest	» Increase the number of populations of ESA-listed Pacific salmon ESUs with stable or increasing trends by 10 percent per year
Output	Enhance the availability of habitat to support sustainable Pacific salmon populations	» Increase amount of spawning and rearing habitat (includes adjacent upland, wetland, estuarine, riparian, and instream habitat) by 50,000 acres per year » Increase the amount of accessible habitat by 100 miles per year
Output	Improve knowledge and management practices to sustain salmon populations	» Increase the number of assessments that address viability and factors limiting recovery by 10 per year » Increase number of watersheds where effectiveness, validation, and/or status monitoring is occurring by 10 per year » Improve harvest and hatchery strategies for sustainable fisheries

achieving the PCSRF strategic goal (see Exhibit 1-2). Performance goals are statements about the desired outcomes (end results) and outputs (activities undertaken to achieve the end results) of the program. Specific measures are identified, for which indicators will demonstrate progress in achieving these goals. The performance goals allow NMFS, states, and tribes to quantitatively or qualitatively assess the accomplishments of PCSRF and measure overall progress toward the PCSRF strategic goal, in addition to tracking salmon recovery investments (inputs) based on expenditures or numbers of projects. The PCSRF performance goals will be refined over time to include more specific targets and timelines for completion at the recovery domain or ESU level.

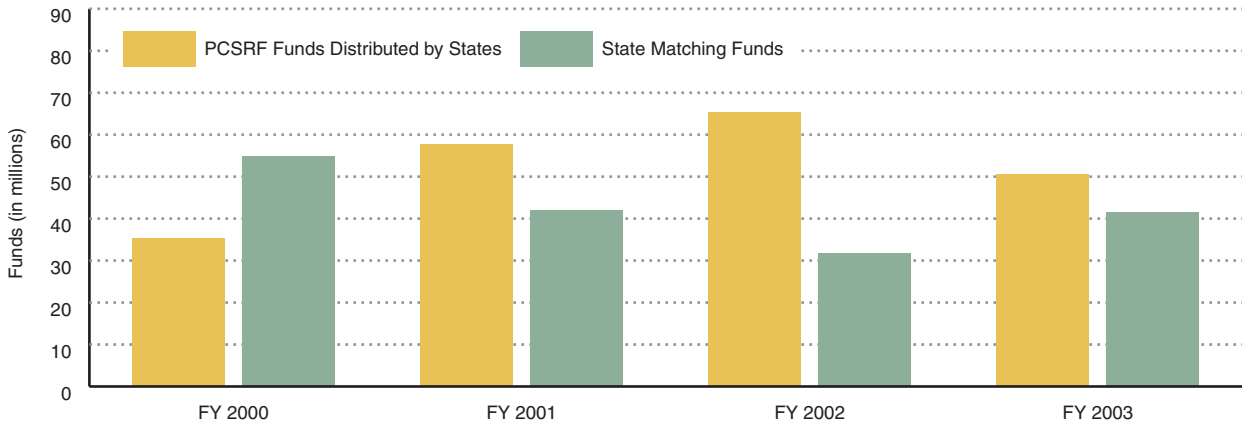
Distribution of Funding for Salmon Conservation and Recovery

NMFS administers the PCSRF program and shares implementation with the states and tribes in the Pacific Coast region. Congressionally-appropriated PCSRF funds are distributed by NMFS to the states and tribes, who subsequently distribute them to various partners to carry out activities addressing the PCSRF goals. Final recipients of PCSRF and matching state funds include state, local, and tribal governments; private landowners; conservation districts; local watershed groups; and other recovery-focused organizations. To govern the distribution of funds to individual projects, NMFS has established memoranda of understanding (MOUs) with the states of Washington, Oregon, California, Alaska, and Idaho as well as three tribal commissions on behalf of 28 tribes.[2] These MOUs establish criteria and processes for funding priority projects.

Under the general guidelines of the MOUs, the states and tribal commissions distribute PCSRF funds to support individual salmon conservation and recovery projects implemented by public and private entities across the region. Washington, Oregon, California, and Idaho provide funds to match the PCSRF distributions through their grant distribution processes. (Tribes are not required to provide matching funds.) The PCSRF and state matching funds are, in turn, also supplemented by private and local contributions made at the project level, including additional resources, volunteer time, and other in-kind donations. Less quantifiable, but equally important, are the increased levels of local support for salmon conservation and recovery actions that occur as a result of the implementation of collaborative PCSRF projects. Exhibit 1-3 shows PCSRF and state matching funds for salmon recovery (not including local and sponsor match) by fiscal year.

[2] The Northwest Indian Fisheries Commission (NWIFC) on behalf of 20 western Washington treaty tribes, the Columbia River Inter-Tribal Fish Commission (CRITFC) on behalf of four Columbia River basin treaty tribes, and the Klamath River Inter-Tribal Fish and Water Commission (KRITFWC) on behalf of four Klamath River basin tribes.

Exhibit 1-3: PCSRF and State Matching Funds for Salmon Recovery in Washington, Oregon, and California, FY 2000–2003



PCSRF funds are awarded to the states and tribes as appropriations become available, which normally occurs well after the October 1 start of the federal fiscal year. States and tribes must submit grant applications to NMFS each year, and those grant awards are followed by state and tribal processes for screening and selecting priority projects and distributing the funds (see Chapter 4). The states of Washington, Oregon, California, and Idaho each conduct a competitive grant process, which normally takes 4 to 12 months to complete. Because of these separate, sequential grant distribution processes, many of the PCSRF funds are committed to projects in the year following the availability of appropriations. Actual project completion can take several additional years because of permitting delays, processes required to issue contracts for the work to be done, construction windows, and the seasonal nature of salmon work. Monitoring and evaluating the outcomes and effectiveness of the project in terms of improved habitat and returning salmon requires many additional years due to salmonid life cycles and other ecological factors.

The state and tribal processes for allocating PCSRF and state matching funds are designed to complement existing state and tribal government processes and agency infrastructure. These processes include rigorous reviews of the scientific and technical merit of proposals, public and stakeholder input, and mechanisms to ensure selected projects include measures to provide for performance reporting and accountability in the use of public funds. Starting with the FY 2003 funding cycle, NMFS has required PCSRF grantees to report information on the results of projects (outputs and outcomes) into a common database using a consistent set of performance indicators (see http://webapps.nwfsc.noaa.gov/pcsrf). This process has improved the ability of NMFS, states, and tribes to show how PCSRF is making significant progress toward the conservation and recovery of Pacific salmon.

Report Organization

The remainder of this report is organized into four chapters. Chapter 2 presents the most current information available about the status and recovery needs of ESA-listed salmon populations in Washington, Oregon, California, and Idaho, and highlights PCSRF and other recovery accomplishments in each of the recovery domains. Chapter 3 summarizes the progress PCSRF projects have made in achieving the performance goals for salmon conservation and recovery region-wide. Chapter 4 describes the program's accomplishments at the state and tribal level. Finally, Chapter 5 offers concluding remarks about PCSRF contributions to salmon conservation and recovery.

Chapter 2: Status and Recovery of Listed Salmon Populations

The Pacific Coast is home to seven different species of salmon. Under the Endangered Species Act, five of these species—Chinook, coho, sockeye, chum, and steelhead—have ESUs listed as threatened or endangered in some portion of the range where they are born, mature, and return to spawn. The intent of these listings is to help recover the species to ensure that future salmon populations are plentiful, self-sustaining, genetically diverse, and geographically distributed. The distribution of these species on the west coast by ESU is shown in Exhibit 2-1.

Recovery Domains

Salmon ESUs are grouped into recovery domains that represent geographic areas. This grouping of ESUs into recovery domains allows an ecosystem approach to identifying the recovery needs and actions necessary for multiple ESUs in a geographic area. The 26 threatened or endangered ESUs of Pacific salmon have been organized into eight recovery domains by NMFS. See the inside back cover of this report for a map.

The following pages present a picture of current knowledge about the listed salmon ESUs by recovery domain. Exhibits 2-2 through 2-9 present information by recovery domain and ESU on the number of adult returns (including percentages of wild and hatchery fish), estimates of historical salmon populations (circa 1900), major factors limiting recovery, status of recovery planning, and progress towards recovery including PCSRF activities. Many factors outside of the direct purview of PCSRF affect recovery such as ocean temperatures and hydrologic patterns, including rainfall and drought. The goal of PCSRF, however, is to ensure that as salmon populations do increase, habitat conditions are adequately improved and protected to sustain the populations through both good and bad cycles of production.

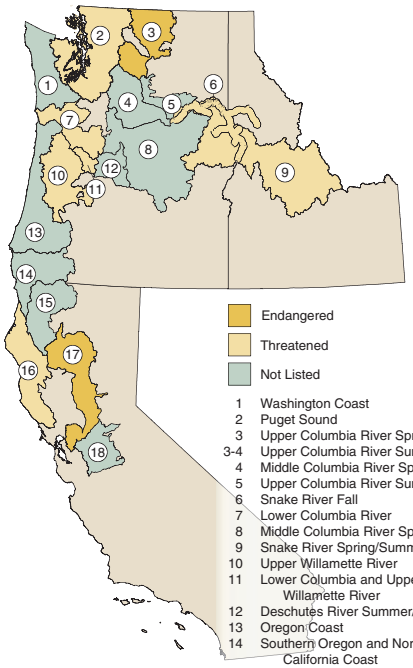
Major Factors Limiting Recovery

Numerous actions have contributed to the decline of salmon populations over time, including habitat degradation and loss, over-harvesting, detrimental hatchery practices, and losses associated with hydropower projects. The factors that contributed to the decline of each ESU were identified during the status review process that occurs when species are considered for ESA listing. Many of the same factors that contributed to the decline of salmon may also hinder recovery, but the relative impact of the factor may have changed over time. The major factors currently limiting recovery are listed (not in any order of importance) in the following exhibits for each ESU. In general, unless the major factors are addressed, the populations within the ESU will likely not recover. The factors tend to be linked, and for the most part, efforts to protect and improve habitat are cumulative, meaning that the habitat value for salmon is increased as each limiting factor is addressed systematically.

Identifying the major factors limiting recovery is important and is occurring in all ESUs, often through the watershed or subbasin planning efforts taking place with the aid of PCSRF funds. Once the factors limiting recovery are understood, then investments for recovery can be targeted to address these factors. In each recovery domain, there are many activities and investments taking place. The following pages identify PCSRF activities within each recovery domain as well as activities outside the purview of PCSRF that are addressing the recovery needs of fish.

Exhibit 2-1. Distribution of Salmon ESUs

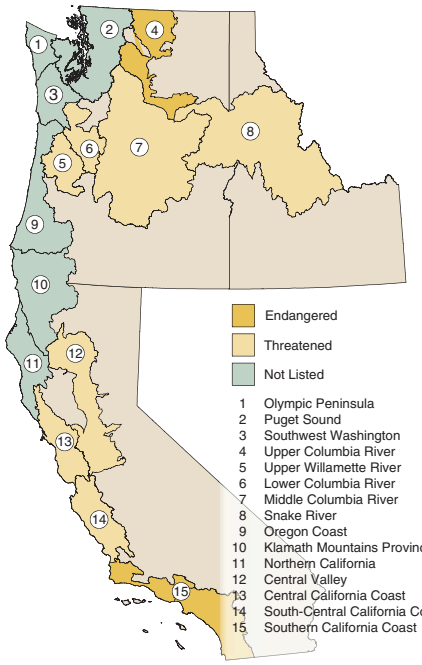
Chinook



Endangered
Threatened
Not Listed

1 Washington Coast
2 Puget Sound
3 Upper Columbia River Spring (E)
3-4 Upper Columbia River Summer/Fall (N)
4 Middle Columbia River Spring
5 Upper Columbia River Summer/Fall
6 Snake River Fall
7 Lower Columbia River
8 Middle Columbia River Spring
9 Snake River Spring/Summer
10 Upper Willamette River
11 Lower Columbia and Upper Willamette River
12 Deschutes River Summer/Fall
13 Oregon Coast
14 Southern Oregon and Northern California Coast
15 Upper Klamath Trinity
16 California Coast
17 Sacramento River Winter (E)
17 Central Valley Spring (T)
17-18 Central Valley Fall and Late Fall (N)

Steelhead



Endangered
Threatened
Not Listed

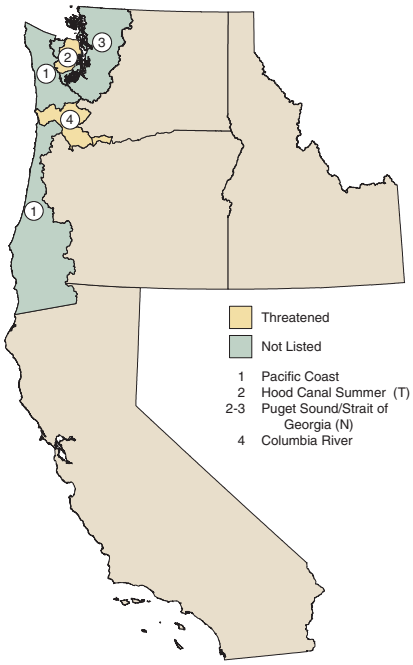
1 Olympic Peninsula
2 Puget Sound
3 Southwest Washington
4 Upper Columbia River
5 Upper Willamette River
6 Lower Columbia River
7 Middle Columbia River
8 Snake River
9 Oregon Coast
10 Klamath Mountains Province
11 Northern California
12 Central Valley
13 Central California Coast
14 South-Central California Coast
15 Southern California Coast

Sockeye

Endangered
Threatened
Not Listed

1 Ozette Lake (T)
2 Lake Pleasant (N)
3 Quinault Lake
4 Baker River
5 Okanogan River (N)
6 Lake Wenatchee
7 Snake River

Chum



Threatened
Not Listed

1 Pacific Coast
2 Hood Canal Summer (T)
2-3 Puget Sound/Strait of Georgia (N)
4 Columbia River

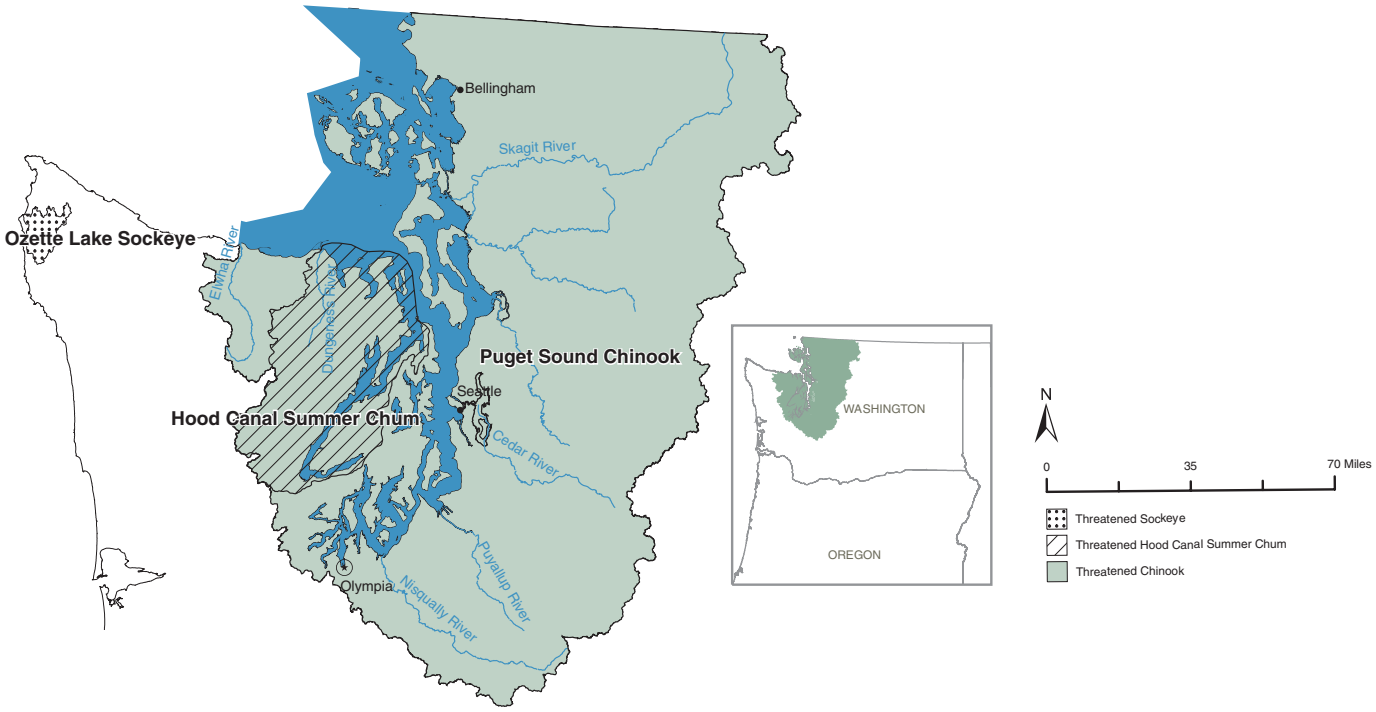
Coho

Threatened
Not Listed

1 Olympic Peninsula
2 Puget Sound/Strait of Georgia
3 Lower Columbia River
4 Southwest Washington
5 Oregon Coast
6 Southern Oregon/Northern California Coast
7 Central California Coast

Exhibit 2-2. Puget Sound Recovery Domain

A Recovery Plan prepared by the Shared Strategy for the State of Washington was submitted to NMFS in July 2005.



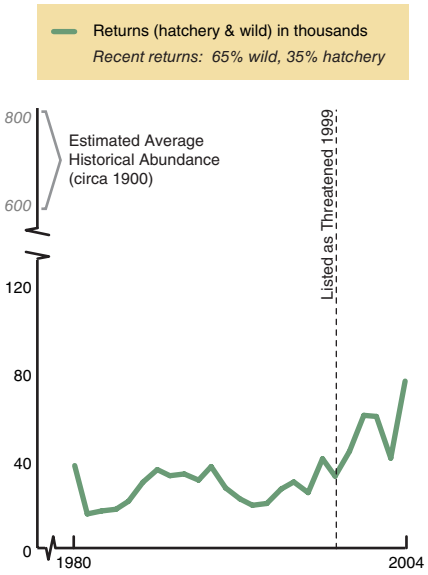
Activities Addressing Recovery Needs for ESUs in the Recovery Domain

- Addressing impacts on listed salmon through harvest strategies and plans
- Upgrading state forest practice rules
- Implementing the Northwest Forest Plan on federal lands
- Implementing habitat restoration projects by local governments and voluntary groups
- Reforming detrimental hatchery practices
- Conforming routine road maintenance with ESA requirements
- Addressing limiting factors through locally-produced watershed-level recovery plans
- Conducting consultations on stream temperature

PCSRF Activities in the Recovery Domain

- 52,802 estuarine acres treated or underway
- 962 artificial estuarine acres created or underway
- 62 stream miles treated or underway through instream habitat projects
- 65 miles of streambank treated or underway through riparian habitat projects
- 232 wetland acres treated or underway
- 41 artificial wetland acres created or underway
- 8,016 acres protected or underway through land acquisition projects

Puget Sound Chinook ESU



MAJOR FACTORS LIMITING RECOVERY

Degraded floodplain and in-river channel structure

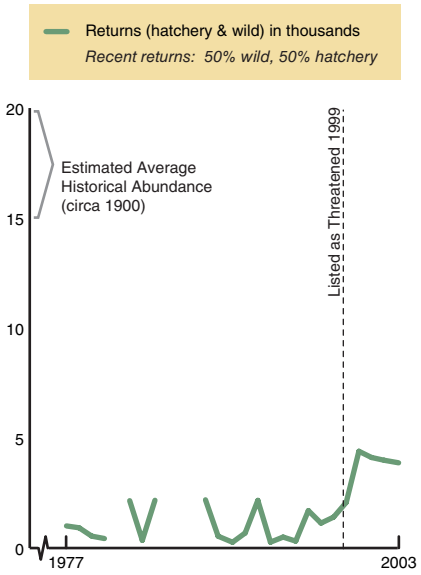
Degraded estuarine conditions and loss of estuarine habitat

Riparian area degradation and loss of in-river large woody debris

Excessive sediment in spawning gravels

Degraded water quality and temperature

Ozette Lake Sockeye ESU



MAJOR FACTORS LIMITING RECOVERY

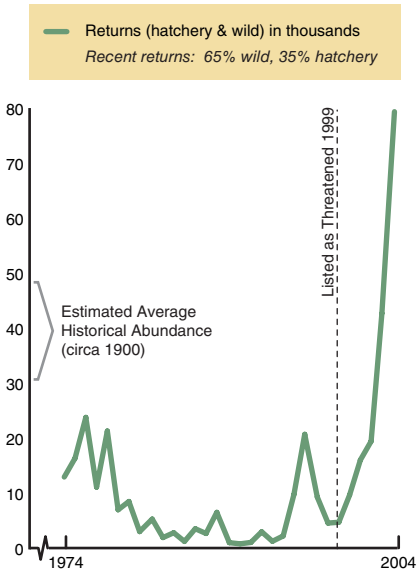
Excessive sediment in spawning gravels

Riparian area degradation and loss of in-river large woody debris

Degraded tributaries/river habitat conditions

Predation on adults by otters and seals

Hood Canal Summer Chum ESU



MAJOR FACTORS LIMITING RECOVERY

Degraded floodplain and mainstem river channel structure

Degraded estuarine conditions and loss of estuarine habitat

Riparian area degradation and loss of in-river wood in mainstem

Excessive sediment in spawning gravels

Reduced stream flow in migration areas

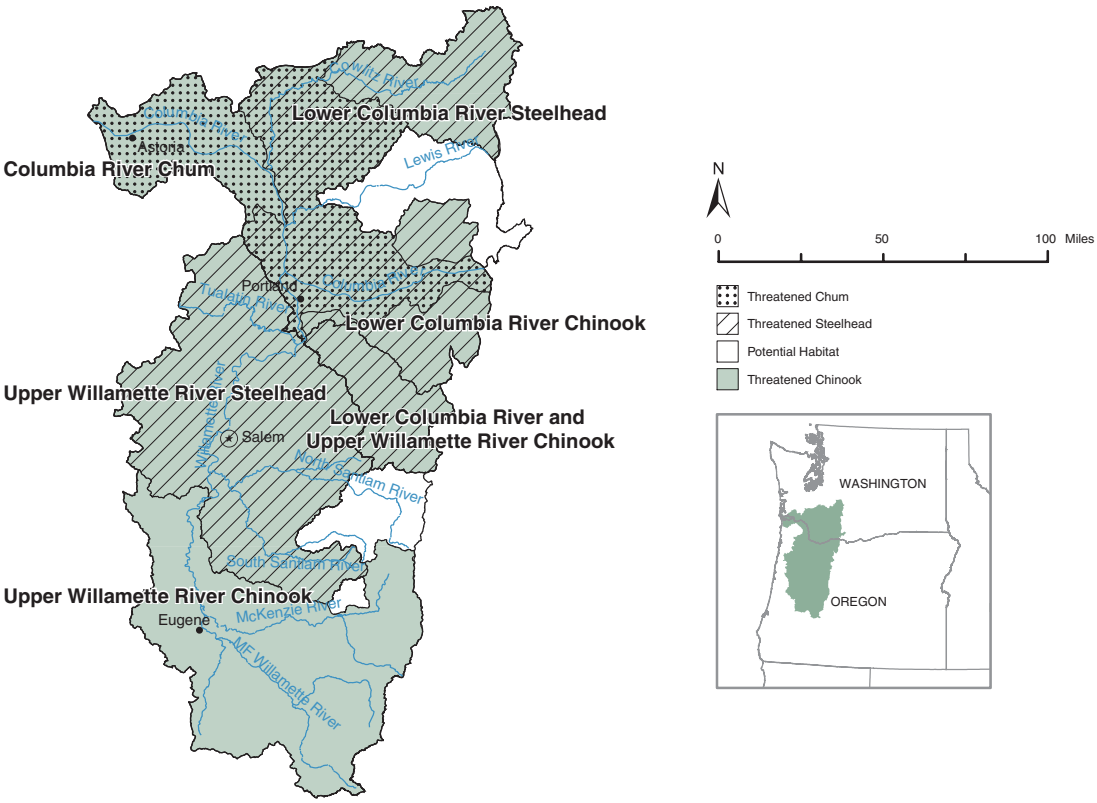
Puget Sound Recovery Plan

In the Puget Sound region, a collaborative recovery planning effort to restore and protect salmon has been underway and culminated in a draft recovery plan transmitted to the National Marine Fisheries Service for formal review in July 2005. The draft recovery plan was developed in conjunction with local watershed interests, ensuring support by the people living and working in the watersheds of Puget Sound. Federal, state, tribal, and local governments provided leadership for this effort; the Shared Strategy for Puget Sound, a nonprofit organization, manages and coordinates the effort.

The Puget Sound plan combines watershed-based plans and actions with necessary regional elements designed to meet the recovery plan requirements of the Endangered Species Act. NMFS will analyze the plan and, if the plan meets the necessary basic requirements of the ESA, will move forward with adoption of the plan in late 2005 or early 2006.

Exhibit 2-3. Willamette/Lower Columbia Recovery Domain

A Recovery Plan for the Washington portion of this domain was submitted to NMFS by the Lower Columbia Fish Recovery Board and the State of Washington in December 2004. This recovery plan for the Washington portion of the domain was endorsed by NMFS, supplemented with additional key elements not in the plan, and released for public review and comment in April 2005.



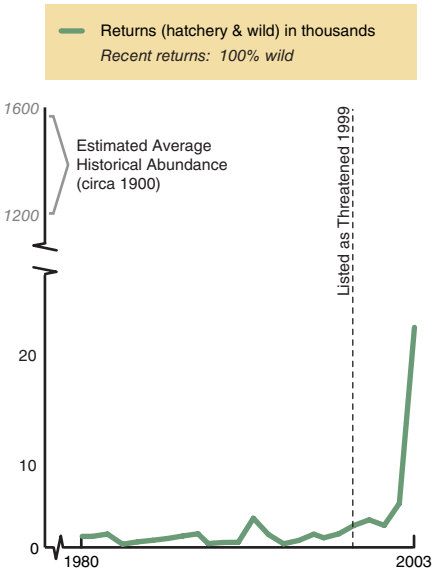
Activities Addressing Recovery Needs for ESUs in the Recovery Domain

- Reducing harvest impacts through selective fisheries and other fishery management strategies
- Addressing passage, flow, and other effects of dams through consultations with hydropower system operators
- Implementing the Northwest Forest Plan on federal lands
- Increasing late-fall flow to allow mainstem spawning access for chum
- Installing fish screens and tailrace barriers
- Reforming detrimental hatchery practices
- Implementing improved forest practices
- Implementing local-scale habitat restoration efforts
- Decreasing avian predation through relocation efforts and other management strategies
- Protecting more than 1,900 acres of riparian, floodplain, and wetland habitats

PCSRF Activities in the Recovery Domain

- 249 stream miles opened or underway through fish passage projects
- 29 stream miles treated or underway through instream habitat projects
- 175 acres treated or underway through upland habitat projects
- 2,081 wetland acres treated or underway
- 35 artificial wetland acres created or underway
- 89 blockages removed/upgraded or underway through fish passage projects
- 92 miles of streambank treated or underway through riparian habitat projects

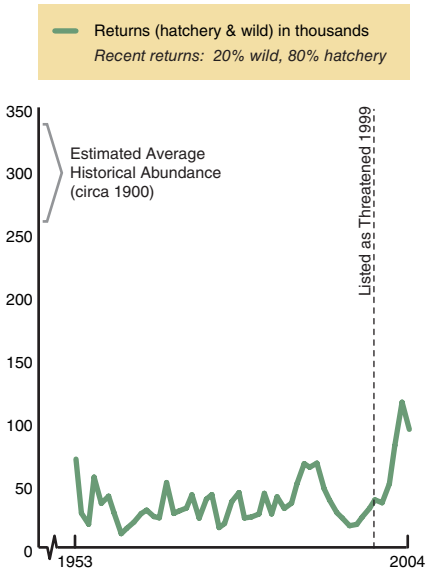
Columbia River Chum ESU



MAJOR FACTORS LIMITING RECOVERY

- Altered channel form and stability in tributaries
- Excessive sediment in tributary spawning gravels
- Altered stream flow in tributaries and mainstem Columbia
- Loss of some tributary habitat types
- Harassment of spawners in tributary and mainstem

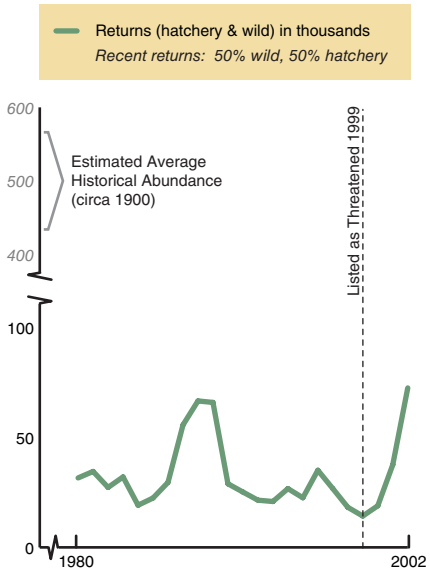
Upper Willamette River Chinook ESU



MAJOR FACTORS LIMITING RECOVERY

- Reduced access to spawning/ rearing habitat in tributaries
- Altered water quality and temperature in tributaries
- Lost/degraded floodplain connectivity and lowland stream habitat
- Altered streamflow in tributaries
- Hatchery impacts

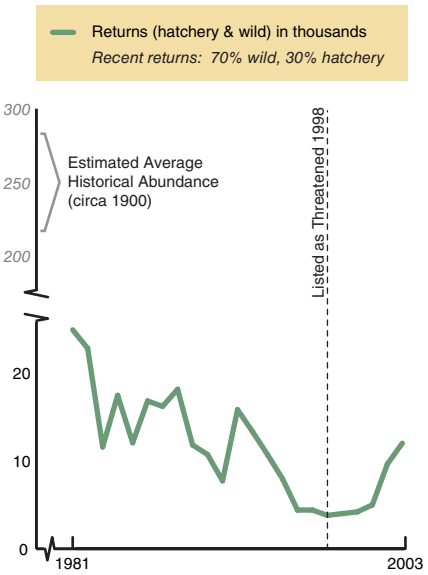
Lower Columbia River Chinook ESU



MAJOR FACTORS LIMITING RECOVERY

- Reduced access to spawning/ rearing habitat in tributaries
- Hatchery impacts
- Loss of habitat diversity and channel stability in tributaries
- Excessive sediment in spawning gravel
- Elevated water temperature in tributaries
- Harvest impacts on fall Chinook

Lower Columbia River Steelhead ESU



MAJOR FACTORS LIMITING RECOVERY

Degraded floodplain and stream channel structure and function

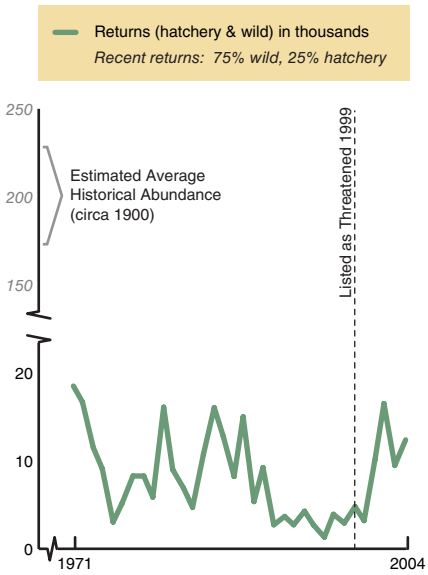
Reduced access to spawning/ rearing habitat

Altered streamflow in tributaries

Excessive sediment and elevated water temperatures in tributaries

Hatchery impacts

Upper Willamette River Steelhead ESU



MAJOR FACTORS LIMITING RECOVERY

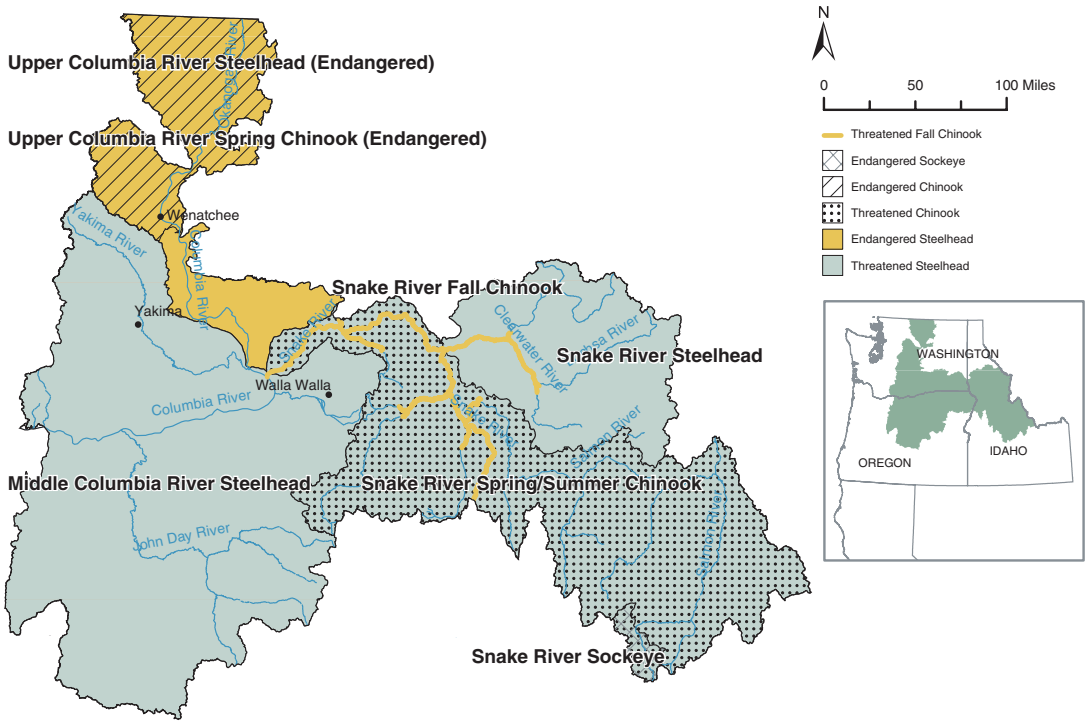
Reduced access to spawning/ rearing habitat in tributaries

Altered water quality and temperature in tributaries

Lost/degraded floodplain connectivity and lowland stream habitat

Altered streamflow in tributaries

Exhibit 2-4. Interior Columbia Recovery Domain



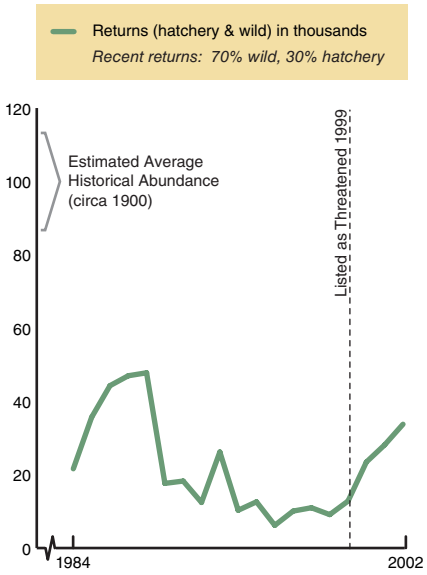
Activities Addressing Recovery Needs for ESUs in the Recovery Domain

- Implementing aggressive screening and reconstruction programs
- Preventing extinction and preserving diversity for various ESUs through a captive broodstock program
- Re-purchasing water rights
- Reconnecting habitat
- Installing instream rock structures
- Improving forestry practices
- Removing marked hatchery fish systematically
- Improving effects on federal lands with federal land management plans and ESA consultations
- Restoring stream flows
- Reducing northern pikeminnow predation through bounty programs
- Improving agricultural practices
- Re-establishing fish passage through ongoing efforts (e.g., Fifteenmile Subbasin—80 fish screens, 5 fish ladders)
- Addressing effects of privately-owned hydroelectric projects through dam relicensing processes
- Implementing Habitat Conservation Plans for privately-owned hydroelectric projects in the mainstem upper Columbia River
- Improving downstream passage, water quality, and flow management actions at mainstem lower Snake and Columbia federal hydropower projects

PCSRF Activities in the Recovery Domain

- 187 stream miles treated or underway through instream habitat projects
- 14,501 acres treated or underway through upland habitat projects
- 627 stream miles assessed or underway for research, monitoring, and evaluation
- 313 miles of streambank treated or underway through riparian habitat projects
- 17,611 acres protected or underway through land acquisition projects
- 138 passage blockages removed/upgraded or underway
- 758 stream miles opened or underway through fish passage projects

Middle Columbia River Steelhead ESU



MAJOR FACTORS LIMITING RECOVERY

Hydropower system mortality at mainstem Columbia River

Reduced stream flow in tributaries

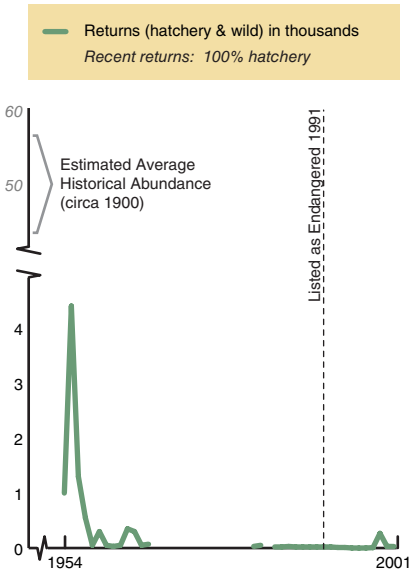
Impaired passage in tributaries

Excessive sediment

Degraded water quality

Altered channel morphology

Snake River Sockeye ESU



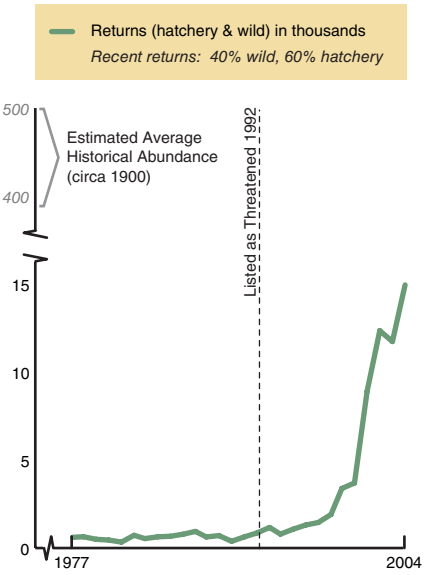
MAJOR FACTORS LIMITING RECOVERY

Reduced tributary stream flow

Impaired tributary passage and blocks to migration

Mainstem lower Columbia hydropower system mortality

Snake River Fall Chinook ESU



MAJOR FACTORS LIMITING RECOVERY

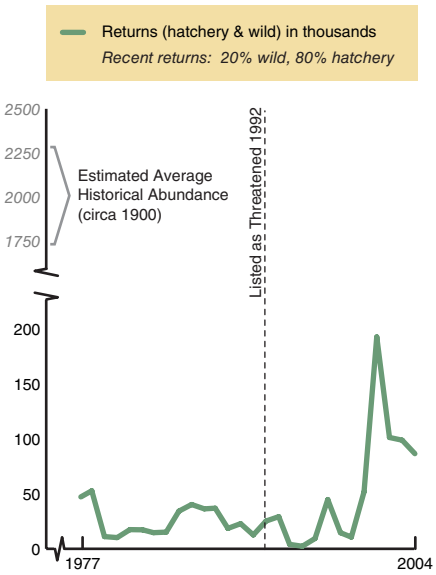
Mainstem lower Snake and Columbia hydropower system mortality

Degraded water quality

Reduced spawning/rearing habitat due to mainstem lower Snake River hydropower system

Harvest impacts

Snake River Spring/ Summer Chinook ESU



MAJOR FACTORS LIMITING RECOVERY

Mainstem lower Snake and Columbia hydropower system mortality

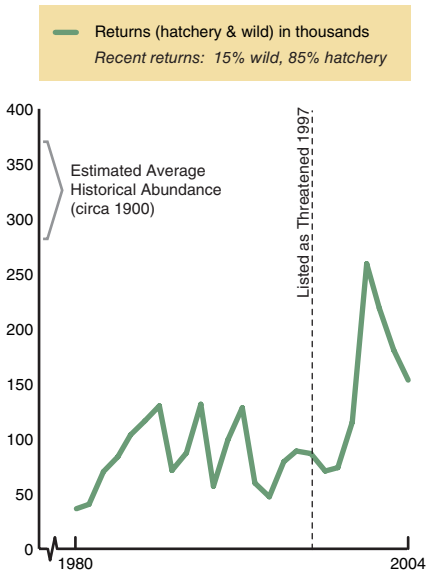
Reduced tributary stream flow

Altered tributary channel morphology

Excessive sediment in tributaries

Degraded tributary water quality

Snake River Steelhead ESU



MAJOR FACTORS LIMITING RECOVERY

Mainstem lower Snake and Columbia hydropower system mortality

Reduced tributary stream flow

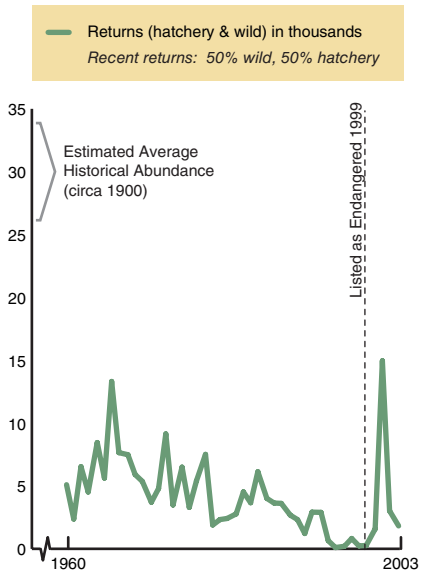
Altered tributary channel morphology

Excessive sediment in tributaries

Degraded tributary water quality

Harvest and hatchery related adverse effects

Upper Columbia River Spring Chinook ESU



MAJOR FACTORS LIMITING RECOVERY

Mainstem Columbia River hydropower system mortality

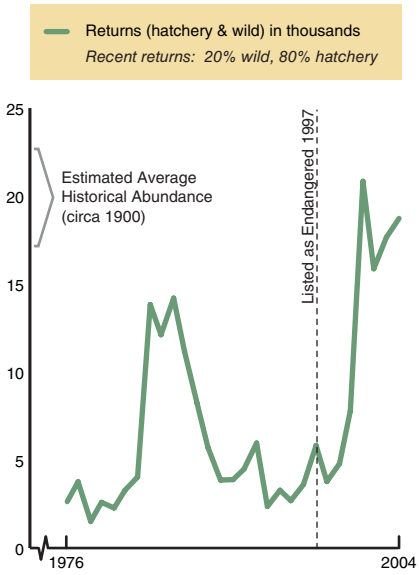
Tributary riparian degradation and loss of in-river wood

Altered tributary floodplain and channel morphology

Reduced tributary stream flow and impaired passage

Harvest impacts

Upper Columbia River Steelhead ESU



MAJOR FACTORS LIMITING RECOVERY

Mainstem Columbia River hydropower system mortality

Reduced tributary stream flow

Tributary riparian degradation and loss of in-river wood

Altered tributary floodplain and channel morphology

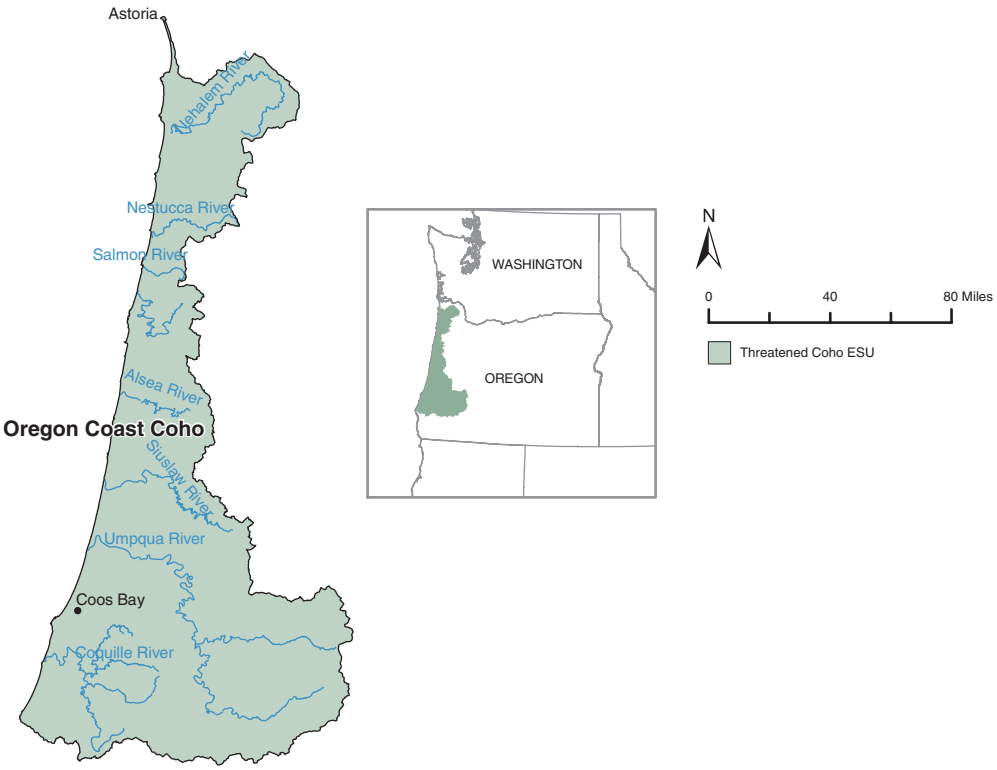
Excessive sediment

Degraded tributary water quality

Engagement in Salmon Recovery and Conservation

Salmon recovery and conservation is of utmost importance to many organizations and individuals. Many of the plans being developed to recover and conserve salmon have been overseen by and had input from a broad collection of entities. For example, in the Puget Sound Recovery Domain, the watershed plan for the Skagit River has included participation from 11 cities, counties, and local agencies; 13 non-profit organizations; three federal agencies; four state agencies; three tribal entities; four educational institutions; and two private companies.

Exhibit 2-5. Oregon Coast Recovery Domain



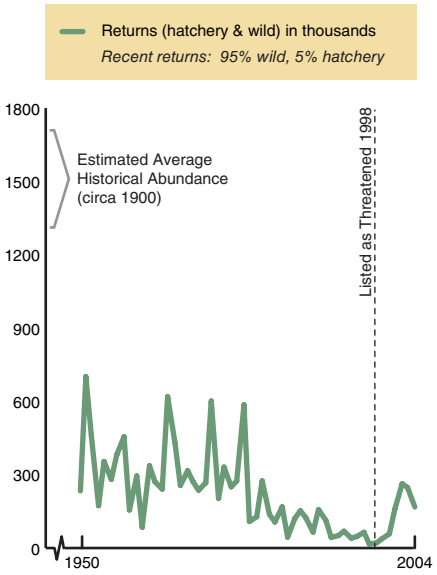
Activities Addressing Recovery Needs for ESUs in the Recovery Domain

- Addressing harvest impacts
- Reforming detrimental hatchery practices
- Developing hatchery and genetic management plans
- Removing fish passage barriers
- Improving road maintenance on state and private forest lands
- Protecting habitat through the Northwest Forest Plan and ESA consultations
- Restoring habitat through watershed councils and landowners
- Protecting more than 1,500 acres of coastal lowland and tidal marsh
- Reducing sediment inputs to coho streams through more than 1,500 miles of road upgrades
- Decommissioning more than 500 miles of roads
- Fencing approximately 230 miles of riparian area and planting 380 miles of riparian stream banks
- Enhancing approximately 520 miles of stream with the placement of large wood

PCSRF Activities in the Recovery Domain

- 15 fish screens installed/upgraded or underway
- 35 wetland acres treated or underway
- 75 stream miles assessed or underway through research, monitoring, and evaluation projects
- 227 passage blockages removed/upgraded or underway
- 237 stream miles opened or underway through fish passage projects

Oregon Coast Coho ESU



MAJOR FACTORS LIMITING RECOVERY

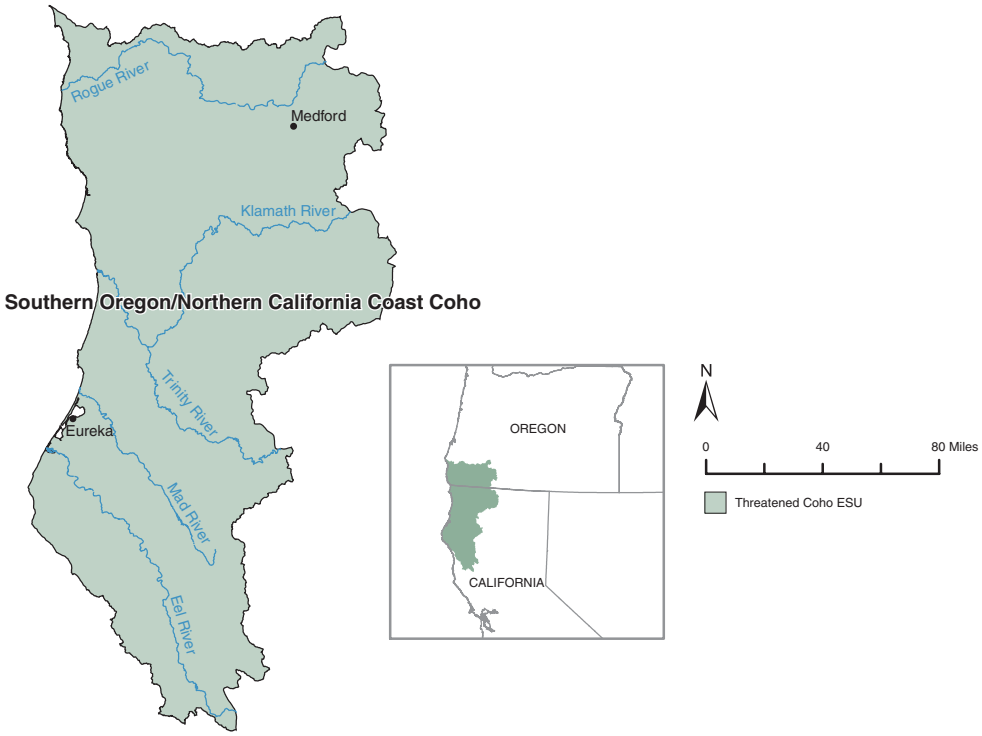
- Loss of overwintering habitat
- Reduced habitat capacity
- Altered stream morphology and complexity
- Excessive sediment
- Variation in ocean conditions
- High water temperature

Oregon Coast Coho Plan

Oregon has used monitoring data gathered over more than two life cycles of coho salmon to evaluate the status of the Oregon Coast Coho ESU. The evaluation has brought together population biologists, conservation biologists, and ecologists to review the population characteristics of coho salmon along the Oregon coast and evaluate the conservation activities being implemented. The state analysis has resulted in a conclusion of minimal viability and identified limiting factors for the ESU and each population in the ESU. NMFS and the state are working with stakeholder groups to develop a conservation recovery plan that will identify the restoration priorities and the actions necessary to lift and sustain the population above minimal viability to a healthier status.

Exhibit 2-6. Southern Oregon/Northern California Coast Recovery Domain

A *Recovery Strategy for California Coho Salmon* was published in 2004 by the California Department of Fish and Game.



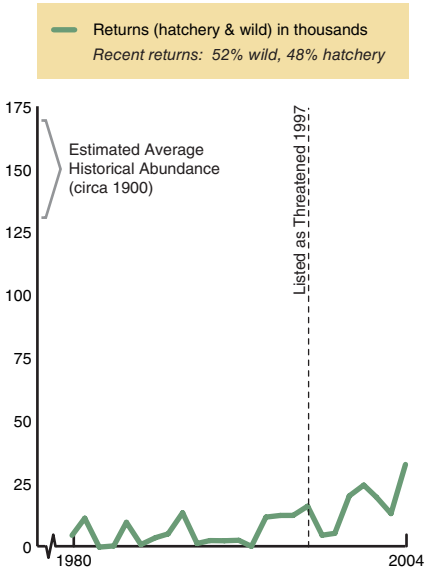
Activities Addressing Recovery Needs for ESUs in the Recovery Domain

- Updating water quality standards for all northern California waters
- Improving agricultural practices, gravel extraction practices, and fish passage efforts
- Coordinating ecosystem management (Northwest Forest Plan) for federal forest lands
- Addressing limiting factors by watershed and ensuring high-priority actions are addressed through the California Coho Recovery Plan
- Reducing harvest impacts
- Reducing hatchery impacts and addressing them through hatchery and genetic management plans
- Working to minimize effects of dams
- Opening over a hundred miles of historic habitat and preventing thousands of cubic yards of sediment from entering water courses through the Five Counties Salmonid Conservation Program
- Developing Rogue River basin fish passage prioritization effort

PCSRF Activities in the Recovery Domain

- 66 fish screens installed/upgraded or underway
- 603 acres treated or underway through upland habitat projects
- 24,984 acres protected or underway under land acquisition projects
- 2,000 blockages removed/upgraded or underway through fish passage projects
- 42 stream miles treated or underway through instream habitat projects
- 27 miles of streambank treated or underway through riparian habitat projects
- 914 stream miles assessed or underway through research, monitoring, and evaluation projects

Southern Oregon/ Northern California Coast Coho ESU*



MAJOR FACTORS LIMITING RECOVERY

Loss of channel complexity, connectivity, and sinuosity

Loss of flood plain and estuarine habitats

Loss of riparian habitats and large in-river wood

Reduced streamflow

Poor water quality, temperature, and excessive sedimentation

Unscreened diversion and fish passage structures

** Note: The data set represents the Rogue River basin, providing information for only a portion of the ESU.*

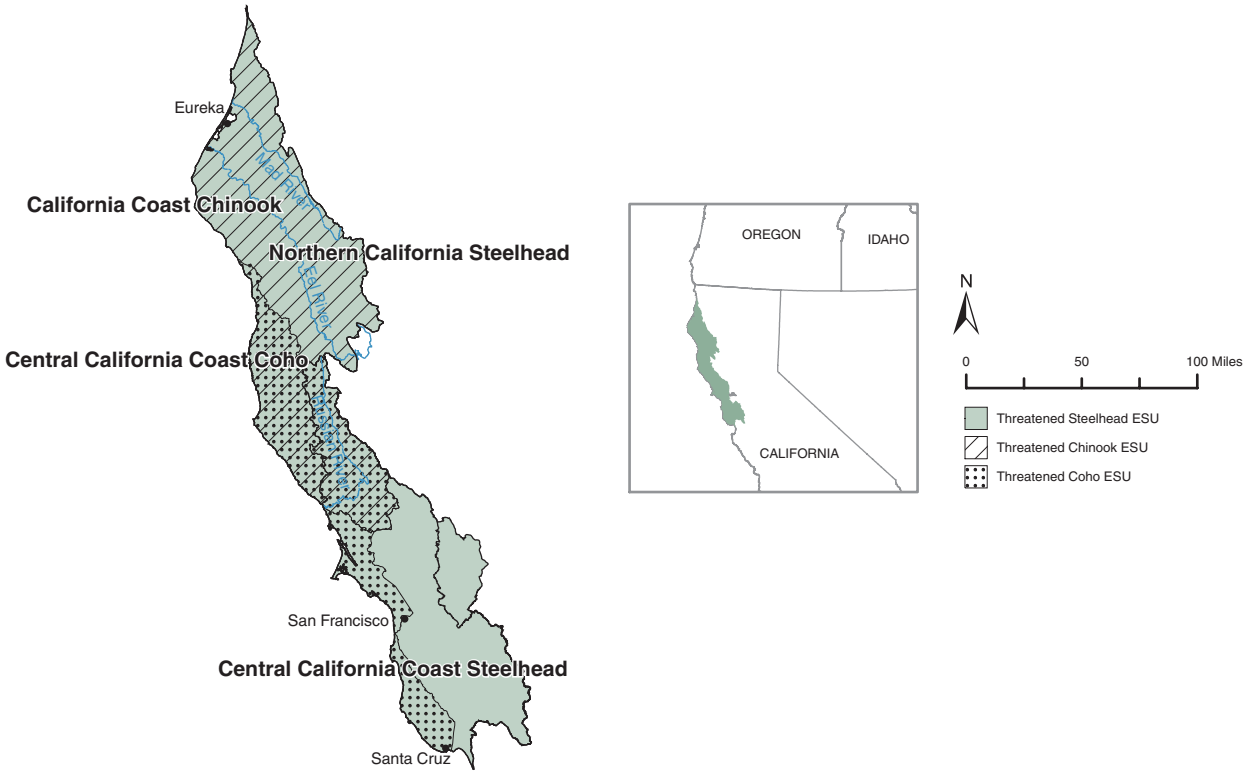
California Coho Recovery Strategy

The state's recovery strategy for California coast coho addresses recovery at both the regional and watershed scales. It was compiled with participation from representatives of federal, state, and local agencies; tribes; commercial fishers; recreational anglers; academia; environmental groups; water agencies; non-profit organizations; and industry groups (cattle, timber, and agriculture).

The state recovery strategy includes over 700 conservation and regulatory recommendations addressing a broad spectrum of land use activities throughout the range of California coho and another 200 recommendations related to agricultural practices. The state has integrated the recovery strategy with its habitat restoration program in an effort to ensure a greater likelihood of funding for high priority watersheds.

Exhibit 2-7. North-Central California Coast Recovery Domain

A *Recovery Strategy for California Coho Salmon* was published in 2004 by the California Department of Fish and Game.



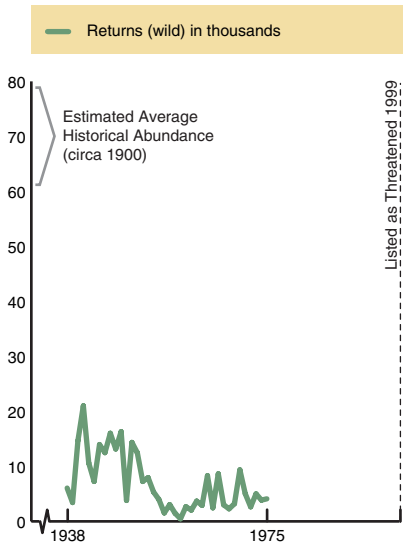
Activities Addressing Recovery Needs for ESUs in the Recovery Domain

- Updating water quality standards for all northern California waters
- Addressing limiting factors by watershed and ensuring high-priority actions are addressed through the California Coho Recovery Plan
- Inspecting or certifying over 10,000 acres of private farmland for fish friendly farming
- Improving hatcheries
- Improving road maintenance practices
- Improving captive broodstock programs

PCSRF Activities in the Recovery Domain

- 9 stream miles opened or underway through fish passage projects
- 9 miles of stream bank treated or underway through riparian habitat projects
- 402 acres treated or underway through upland habitat projects
- 73 stream miles assessed or underway through research, monitoring, and evaluation projects
- 651 blockages removed/upgraded or underway through fish passage projects

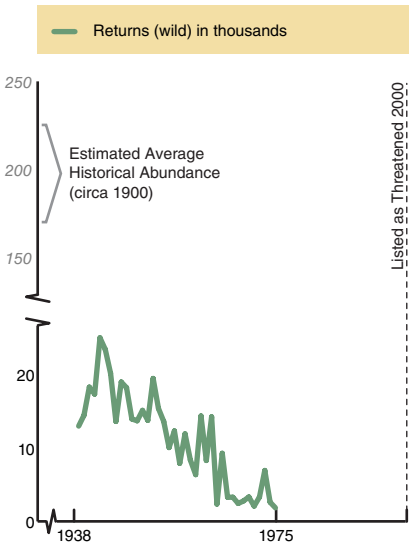
California Coast Chinook ESU*



MAJOR FACTORS LIMITING RECOVERY

- Loss of channel complexity, floodplain and estuarine habitats
- Loss of riparian habitat
- Excessive sediment from roads
- Degraded water quality
- Reduced access to spawning/ rearing habitat
- Unscreened diversions

Northern California Steelhead ESU*



MAJOR FACTORS LIMITING RECOVERY

- Loss of channel complexity, floodplain and estuarine habitats
- Loss of riparian habitat
- Excessive sediment from roads
- Degraded water quality
- Reduced access to spawning/ rearing habitat
- Unscreened diversions

** Note: Time series ESU abundance data for the four ESUs within this recovery domain are extremely limited. Data from dam counts on the South Fork Eel River from 1938–1975 represent the best proxy for the California Coast Chinook ESU and the Northern California Steelhead ESU and are shown here.*

Central California Coast Steelhead ESU*

- Threatened 1997
- Historical estimate 94,000
- Current estimate 14,100

MAJOR FACTORS LIMITING RECOVERY

- Loss of channel complexity, floodplain and estuarine habitats
- Urbanization
- Loss of riparian habitat
- Excessive sediment from roads
- Degraded water quality
- Reduced access to spawning/ rearing habitat
- Unscreened diversions

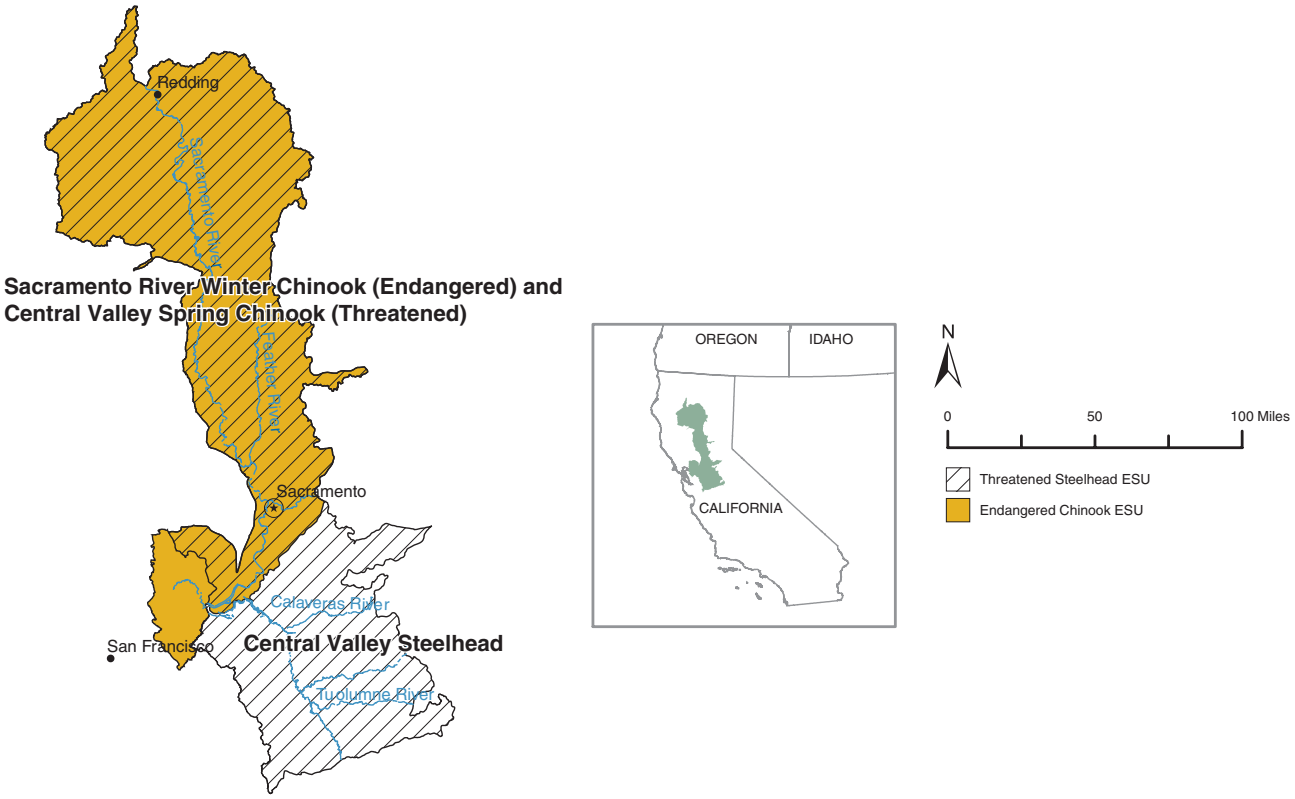
Central California Coast Coho ESU*

- Threatened 1996 (proposed reclassification as endangered, June 14, 2004)
- Historical estimate 56,100
- Current estimate 6,160

MAJOR FACTORS LIMITING RECOVERY

- Loss of channel complexity, floodplain and estuarine habitats
- Urbanization
- Loss of riparian habitat
- Excessive sediment from roads
- Degraded water quality
- Reduced access to spawning/ rearing habitat
- Unscreened diversions

Exhibit 2-8. Central Valley Recovery Domain

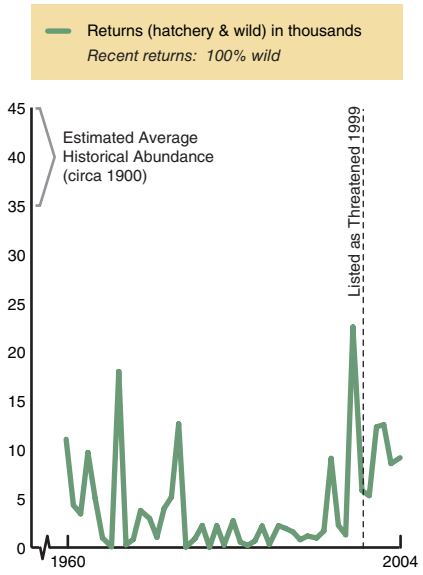


Activities Addressing Recovery Needs for ESUs in the Recovery Domain

- Evaluating termination of the captive broodstock program for Sacramento Winter Chinook (the program was once essential for preventing extinction of the population, but escapement is increasing)
- Increasing water releases from dams
- Improving water quality and water supply through cooperative efforts by CALFED
- Modifying dams to improve habitat, temperature, and flow
- Screening water diversions
- Enhancing efforts to reduce illegal harvest
- Planning Battle Creek dam removal program
- Improving instream flows

Note: PCSRF funds are not allocated to projects in this recovery domain.

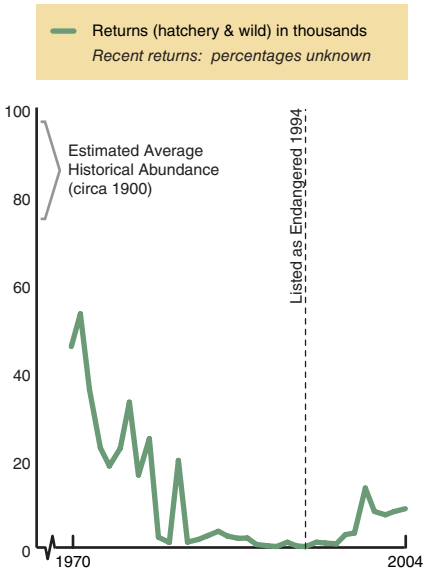
Central Valley Spring Chinook ESU



MAJOR FACTORS LIMITING RECOVERY

- Reduced access to spawning/rearing habitat from impassable barriers
- Altered and degraded habitat
- Temperature
- Hatchery fish impacts
- Degraded water quality

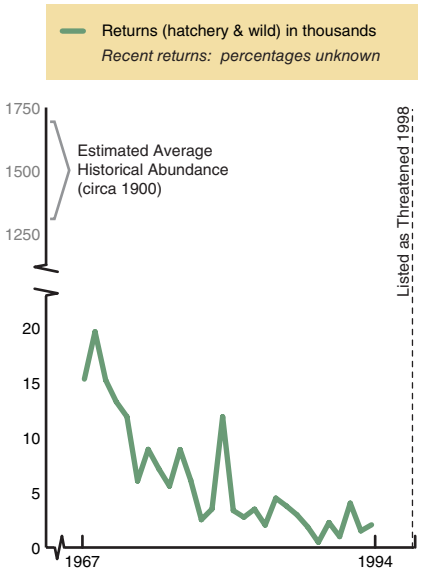
Sacramento River Winter Chinook ESU



MAJOR FACTORS LIMITING RECOVERY

- Single population low in abundance
- Reduced access to spawning/rearing habitat from impassable barriers
- Altered and degraded habitat
- Reduced stream flow
- Temperature

Central Valley Steelhead ESU*

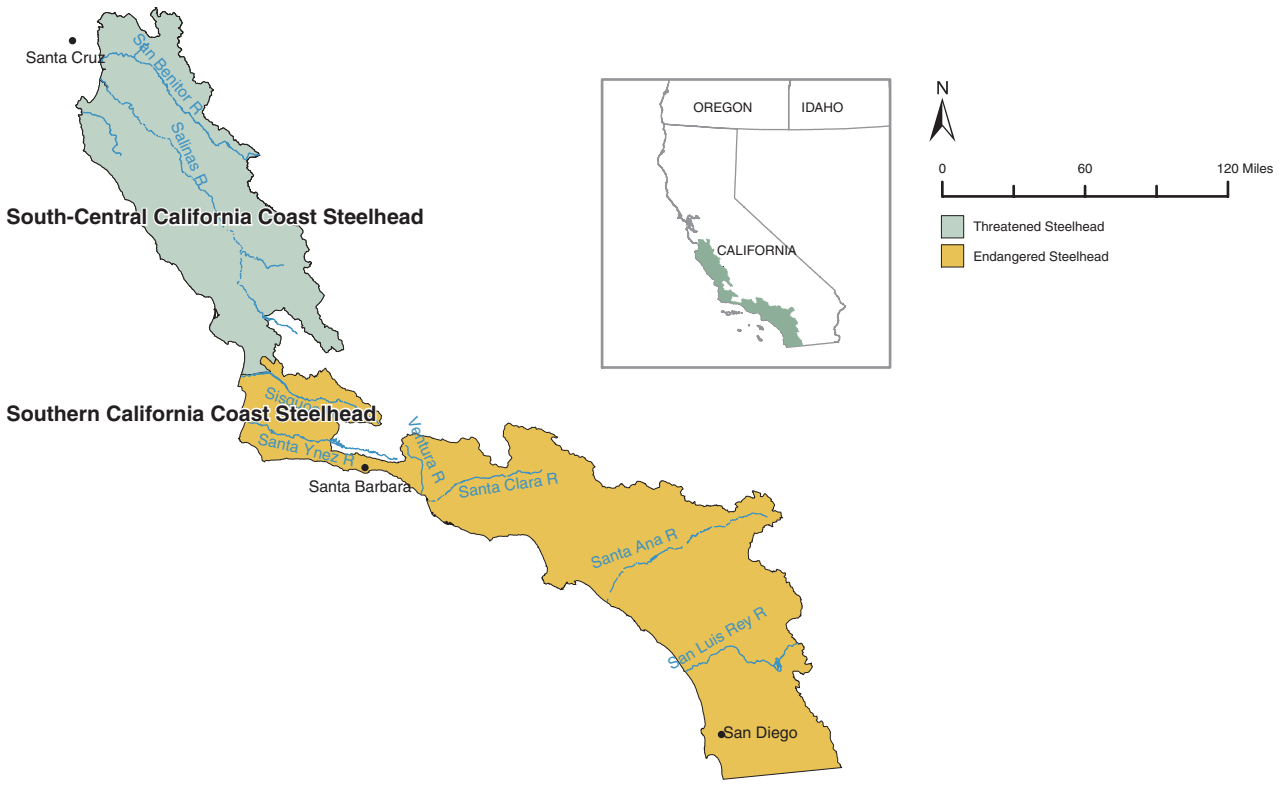


MAJOR FACTORS LIMITING RECOVERY

- Reduced access to spawning/rearing habitat from impassable barriers
- Altered and degraded habitat
- Temperature
- Unscreened diversions
- Hatchery fish impacts
- Degraded water quality

** Note: The data set represents dam counts from 1967–1994 at the Red Bluff Diversion Dam fish ladders, providing information on only a representative portion of the ESU.*

Exhibit 2-9. South-Central/Southern California Coast Recovery Domain



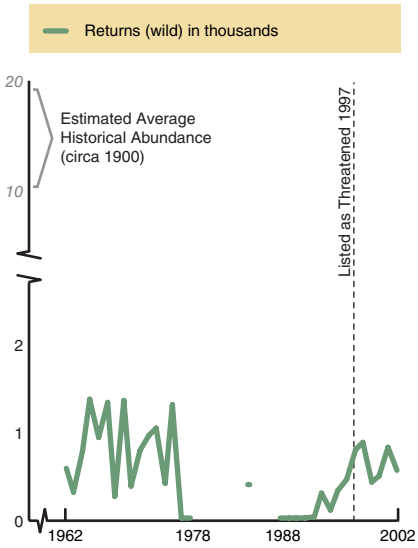
Activities Addressing Recovery Needs for ESUs in the Recovery Domain

- Removing various impediments to passage
- Creating several fish passage facilities
- Reducing impacts from several dam operations
- Planning three large dam removals
- Curtailing recreational harvests
- Stocking hatchery fish above impassable barriers only

PCSRF Activities in the Recovery Domain

- 57 blockages removed/upgraded or underway through fish passage projects
- 24 acres protected or underway through land acquisition projects
- 21 stream miles assessed or underway through research, monitoring, and evaluation projects

South-Central California Coast Steelhead*



MAJOR FACTORS LIMITING RECOVERY

Alteration of natural stream flow patterns

Physical impediments to fish passage

Alteration of floodplains and channels

Sedimentation of spawning and rearing habitat

Spread of exotic species

Loss of estuarine habitat

Competition with hatchery fish

Recreational angling

** Note: The data set represents dam counts at the San Clemente Dam fish ladder on the Carmel River, providing information for only a portion of the ESU. Fish count methodology changed in 1980. No records exist for 1978–83 and 1985–87. It is also estimated that between 10–50% of steelhead spawn below the dam.*

Southern California Coast Steelhead

» Listed as endangered 1997; range extended 2002
» Historic estimate 32,000–46,000
» Current estimate <100 fish

MAJOR FACTORS LIMITING RECOVERY

Alteration of natural stream flow patterns

Physical impediments to fish passage

Alteration of floodplains and channels

Sedimentation of spawning and rearing habitat

Spread of exotic species

Loss of estuarine habitat

Competition with hatchery fish

Recreational angling

** Note: There are no time series ESU abundance data for the Southern California Coast Steelhead ESU.*

Technical Recovery Teams (TRTs)

TRTs advise recovery planners on the relationships between habitat and fish productivity (number of returning adults produced by the parent spawner), the spatial distribution of fish and their habitats, and aspects of diversity including the expression of different life history traits (run timing, relative habitat use, age structure, size).

These four elements—abundance, productivity, spatial distribution, and genetic diversity—must be considered when developing recovery plans and determining whether a species is recovered.

TRTs consist of six to nine experts in areas such as salmon biology, population dynamics, and conservation biology. As well, they include at least one member with experience in and knowledge of the specific geographic area and the salmonid species that inhabit the area.

Recovery Planning

The ESA requires that recovery plans for listed species be developed as blueprints to determine actions for implementation and funding priorities. Technical Recovery Teams (TRTs) were formed by NMFS for each recovery domain to provide the technical basis for recovery plans. The NMFS approach to recovery planning for Pacific Coast ESUs has been to support collaborative efforts with strong participation and leadership from many entities within a recovery domain, including federal, state, local, and tribal government entities, as well as other stakeholders.

Subbasin level planning and watershed assessment projects provide a critical basis for recovery planning, by helping to identify not only the factors limiting recovery, but needed recovery actions. Knowing what actions are likely to have a large effect on recovery greatly improves wise investment of recovery dollars to address priorities. The first locally developed regional recovery plan was presented to NMFS in late 2004, and others continue to be developed. NMFS is using these locally developed plans to complete ESA recovery plans. Many groups—from local watershed councils and environmental organizations to individual landowners and businesses—are involved in recovery planning.

Monitoring and evaluation projects provide the information needed to assess with some measure of scientific certainty whether recovery actions are appropriate and effective. PCSRF is supporting planning, assessment, and monitoring activities in all domains. The completion of monitoring and evaluation projects will also help to refine and revise performance goals and indicators for the PCSRF program over time.

Chapter 3: Pacific Coastal Salmon Recovery Fund Performance

The strategic goal of PCSRF is to contribute to the restoration, conservation, and sustainability of Pacific salmon populations and their habitats. Understanding the progress toward this overall goal is essential for ensuring wise investments of resources to accomplish specific outcomes. In response to the OMB Program Assessment Rating Tool (PART) assessment[3] and congressional direction, NMFS and the PCSRF grantees (states and tribes) have been working together since 2003 to develop performance measures and indicators to track progress and improve the collection and reporting of data on program outcomes.

Developing appropriate performance goals and indicators for PCSRF has been a challenge. The interrelated nature of salmon recovery requirements—including the multiple factors that limit self-sustaining populations, the complex and varied life-cycles of salmon, and the lack of information about many populations—makes it difficult to develop performance goals and indicators that match the PART model based on fiscal years. Despite these constraints, NMFS has made an aggressive effort to develop and implement project-level reporting aligned with an initial set of performance indicators in a very short time. As a result of this effort, data are becoming available for measuring progress toward specific PCSRF performance goals. Whereas past reports only reported the number of projects funded to improve habitat, new performance indicators are providing some assessment of progress toward salmon sustainability, as well as progress in specific areas (e.g., improved habitat and fish passage due to stream miles treated and the number of culverts replaced or repaired).

In reviewing the information provided in this chapter, it is important to note that many funded projects span multiple years and not all are complete. The numbers reported in the following tables represent an indication of cumulative progress in projects funded from FY 2000–2004. This chapter examines current knowledge of PCSRF projects from FY 2000–2004 across the Pacific Coast region to report on the progress toward the performance goals.

Progress Toward Performance Goals

Exhibit 3-1 summarizes the goals and measures and the indicators of progress in addressing the performance goals. Watershed assessments and plans will be used to refine the targets over time. Although not all projects have been completed and some are not able to report progress, the statistics presented below report on those that are complete and some that are underway.

Research is ongoing to determine sustainability based on the viability of salmon populations. Viability is a function of the number of salmon, and their productivity, distribution, and genetic diversity. The research to determine viability and recovery for sustainable populations requires in-depth analysis of historical distributions of salmon populations and assessment of the effects of natural and human-induced conditions.

---

[3] The lack of a performance measurement system for PCSRF was first noted in the "Performance and Management Assessments" section of the "Budget of the United States Government Fiscal Year 2004." A "Program Assessment Rating Tool" (PART) was applied to the PCSRF by the Office of Management and Budget (OMB), resulting in a rating of "results not demonstrated." The basis for the rating was: (1) program-wide performance measures had not yet been developed, although each state was developing performance measures related to its individual needs; (2) the program had not been able to allocate funds based on recovery needs of specific salmon populations; and, (3) the long-term goal of the program is to contribute to recovery and conservation of Pacific salmon, and the program, which started in 2000, had not finalized annual measures yet. The PCSRF program implemented a data system for the collection of performance indicators in early 2003 setting the stage for development of performance measures and a system for reporting progress on those measures.

Exhibit 3-1: Progress in Performance Goals

Performance Goal	Performance Measure	Cumulative Indicator (FY 2000–FY 2004)
Increase naturally spawning Pacific salmon populations to levels that are sustainable and allow for annual harvests	Increase populations of ESA-listed Pacific salmon ESUs	**Increased fish populations over a 5-year period in 16 out of the 20 ESUs** with trend data within the past 10 years (See ESU graphs in Chapter 2)
Enhance the availability of habitat to support sustainable Pacific salmon populations	Increase amount of spawning and rearing habitat (including adjacent upland, wetland, estuarine, riparian, and instream habitat)	*Habitat Restored* » **Upland: 142,064** acres » **Wetland: 1,908** acres being created, **7,349** acres in treatment » **Estuarine: 2,370** acres being created, **53,593** acres in treatment » **Riparian: 1,355** miles » **Instream: 637** miles *Habitat Protected* » **51,520** acres acquired or protected » **212** miles of stream bank acquired or protected
	Improve habitat accessibility to support sustainable salmon populations	» **3,566** blockage removals » **1,520** stream miles being opened » **527** fish screen installations
Improve knowledge and management practices to sustain salmon populations	Increase understanding of viability and factors limiting recovery	» **26 ESUs (all)** have identified factors limiting recovery » **204 assessments** conducted
	Increase number of watersheds where effectiveness, validation, and/or status monitoring is occurring	**9,941** miles of streams monitored
	Improve harvest strategies that ensure sustainable salmon populations	**148,908,317** fish marked for management strategies

Of the 20 ESUs with trend data within the past 10 years, 16 are showing increases in salmon abundance over the past five years (see Chapter 2 for supporting data). Two are stable, and two with very small numbers of fish are declining. Complete data are not available for six ESUs. Salmon populations fluctuate widely, and for many ESUs it is difficult to draw conclusions from the limited data available. Development of accurate estimates of returning salmon requires the collection of data over many watersheds within an ESU over many years to account for natural variations.

There is variability across ESUs in the percentage of returns that are wild salmon versus hatchery salmon. Hatchery fish can contribute to salmon recovery by providing enough fish to support harvest and meet tribal treaty fishing rights. They also can provide the last level of protection against extinction. Recent hatchery reforms are helping to address some of the negative aspects of hatchery-bred fish, such as competition and loss of genetic diversity.

In the habitat realm, there is significant activity in estuarine habitat creation and treatment, with nearly 56,000 acres treated, created, or in the process of treatment/creation. This is essential habitat for an important and vulnerable stage in the salmon lifecycle. Additionally, riparian habitat found along rivers, streams, and creeks protects riverbanks, provides erosion control, and protects water quality. More than 1,350 miles of riparian habitat are either restored or in the process of restoration. These restoration efforts are being supplemented with improved forestry practices in most of the PCSRF states.

Removal of barriers has been a critical component in improving access to spawning and rearing habitat. PCSRF projects to remove passage barriers, as well as projects to replace ineffective culverts, are allowing fish to access habitat that has been unavailable for many years. More than 1,500 stream miles have been or are in the process of being made accessible to fish.

Watershed assessments improve understanding of the factors limiting salmon recovery. The data from these assessments contribute to site-specific knowledge of conditions such as limited access to habitat, water flow issues, harmful temperature regimes, and lack of suitable habitat. Although this provides the basis for recovery plans and appropriate recovery actions, more assessments are needed for a complete region-wide picture of habitat.

The performance goals listed above show progress in our ability to quantify the results of investments in salmon recovery. The factors causing the decline of salmon have been identified, and in many cases the current factors limiting recovery are better understood. PCSRF projects are not only supporting assessment efforts to identify the factors, but are moving toward focusing specific activities to address the limiting factors (see recovery domain information in Chapter 2).

Examples of the Type and Numbers of Region-wide PCSRF Projects* (FY 2000 to FY 2004)

- 1,125 planning and assessment projects identifying limiting factors in critical watersheds
- 1,847 habitat projects performing watershed treatment and restoration
- 564 fish passage projects opening upstream habitat through blockage removal and culvert upgrade
- 648 instream habitat projects restoring deteriorated stream conditions
- 562 riparian habitat projects repairing degraded stream banks critical to salmon spawning and rearing
- 437 upland habitat projects restoring water quality and quantity to watersheds downstream
- 74 wetland and 63 estuarine projects restoring essential habitat needed for salmon migration
- 154 land acquisition projects protecting key salmon habitat
- 619 research, monitoring, and evaluation projects used for planning and assessment
- 278 outreach and education events informing the public about the condition of Pacific salmon and the need for conservation

** The cumulative results of these projects are the numbers reported as "indicators" in Exhibit 3-1.*

45 volunteers planted 333 trees along the Middle Fork Snoqualmie River in May, 2005

Next Steps

PCSRF will continually examine the identified reporting metrics and performance indicators to improve the ability to measure outcomes as the program evolves. Research, monitoring, and evaluation (RM&E) programs are now beginning to develop the needed correlations between PCSRF activities and salmon returns. Measuring program performance is an iterative process and, over time, knowledge gained from the variety of indicators will contribute to a cumulative understanding of outcomes and program effectiveness. With the PCSRF performance measurement system now in place, the program can begin to report on projects annually or cumulatively to Congress, OMB (for PART), and other interested parties, although annual project reporting is a complex issue. Because of the various state and tribal commission funding and implementation time frames (see Chapter 4), not all projects can be characterized in the same year. Nevertheless, efforts to improve reporting and measuring progress in recovering salmon will continue and indicators will be refined over time.

Chapter 4: State and Tribal Efforts

The states and tribal entities receiving PCSRF funds are engaged in numerous efforts to protect, restore, and conserve salmon populations. Funds have been allocated by congressional direction and in some cases are earmarked for specific projects or programs. In general, PCSRF funds are provided to a state or tribal oversight entity that solicits projects, reviews potential projects for scientific and technical merit, ensures the projects reflect appropriate restoration or conservation priorities, and distributes the funds. In the case of states, these funds are matched with state funds or other resources.

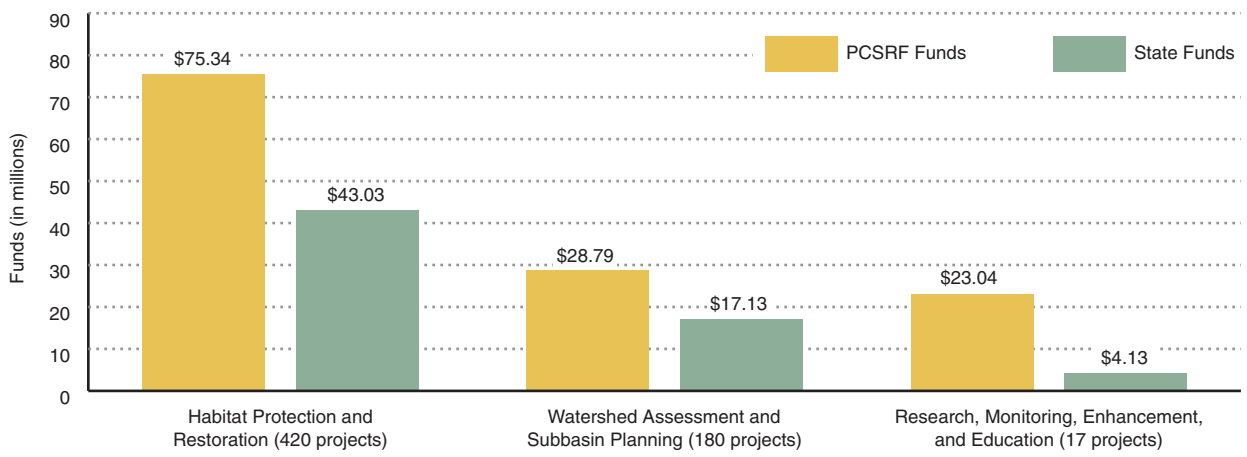
The states have developed numerous manuals and guides to ensure that project recipients are efficient and effective in undertaking salmon recovery projects. Examples include Washington's *Roadmap for Salmon Habitat Conservation at the Watershed Level* and *Guidance on Watershed Assessment for Salmon*; *Oregon Aquatic Habitat Restoration and Enhancement Guide* and *Oregon Watershed Assessment Manual*; and *California Salmonid Stream Habitat Restoration Manual.* The states have also developed comprehensive monitoring and evaluation plans to validate the effectiveness of the restoration projects, such as the *Washington Comprehensive Monitoring Strategy and Action Plan for Watershed Health and Salmon Recovery*, *Oregon Plan Monitoring Strategy*, and California's *Monitoring the Implementation and Effectiveness of Fisheries Habitat Restoration Projects.*

This chapter presents a summary of ongoing PCSRF efforts at the state and tribal level to restore and conserve salmon populations. The chapter describes the process and timing used by each state agency or tribal entity to distribute funds; locations of projects; number of projects; and how funds are allocated toward planning and assessment, habitat protection and restoration, and other activities.

Washington

The State of Washington's salmon recovery efforts have focused primarily on protecting and restoring habitat for salmon. Exhibit 4-1 summarizes the allocation of funds and projects in Washington from FY 2000–2004.

Exhibit 4-1: Washington's Distribution of PCSRF and State Funds, FY 2000–2004



As of February 2005, Washington had committed about $130.4 million in PCSRF funds. Federal funding was supplemented by over $64 million in state salmon conservation and restoration funds, and by approximately $76 million in additional local and private matching funds. These funds and others leveraged over 560,000 volunteer hours in FY 2000–2004.[4]

In Washington, PCSRF and matching state funds are allocated through a competitive grant distribution process that begins in spring and ends the following January (see the timeline in Exhibit 4-2). The dates for this distribution process will change in the 2005 funding cycle. In 2004, 188 project proposals were received and 105 were funded.

Washington has reported the following salmon habitat restoration accomplishments since 1998:

- Returned over 300,000 acre-feet of water to salmon-bearing streams.
- Removed over 1,480 fish passage barriers.
- Completed more than 560 projects to improve water quality problems; 57 percent of watersheds have a good index of water quality for salmon.
- 64 percent of hatchery programs meet requirements of the Endangered Species Act.
- Volunteers have donated more than 150,000 hours to salmon recovery.
- Approved the purchase of nearly 11,000 acres for salmon restoration.[5]

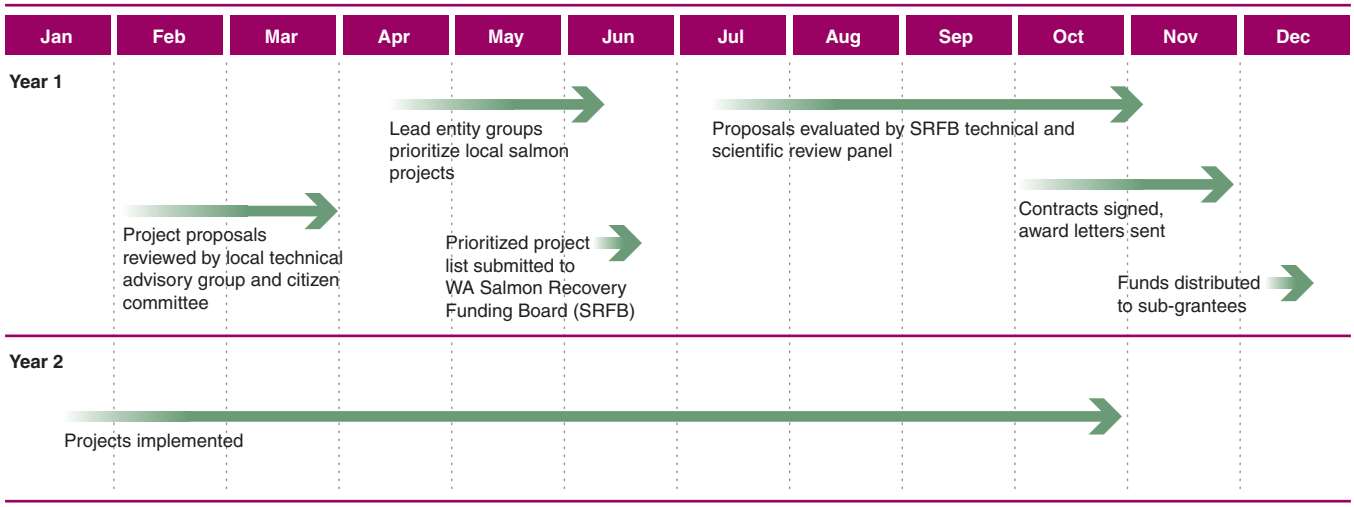
In addition to supporting those actions, Washington's FY 2000–2004 PCSRF allocation is being used to:

- Install or upgrade 419 fish screens to prevent fish from entering irrigation channels and other areas with unsuitable habitat.
- Protect about 150 miles of stream banks through land acquisition.
- Acquire 13,093 acres of habitat to conserve salmon habitat.
- Restore about 253 miles of stream habitat for salmon.
- Treat 53,627 acres of estuaries to improve habitat conditions for salmon.

The locations of state and tribal PCSRF projects in Washington are shown in Exhibit 4-3. More information about Washington's salmon conservation and restoration efforts is available from the Governor's Salmon Recovery Office at http://www.governor.wa.gov/gsro/ and from the Salmon Recovery Funding Board at http://www.iac.wa.gov/srfb/.

[4] State of Washington, Governor's Salmon Recovery Office, *2004 State of Salmon in Watersheds Report*, (Olympia, WA: Governor's Salmon Recovery Office, 2004), 17.
[5] State of Washington, 66.

Exhibit 4-2: Washington PCSRF Funds Distribution Timeline



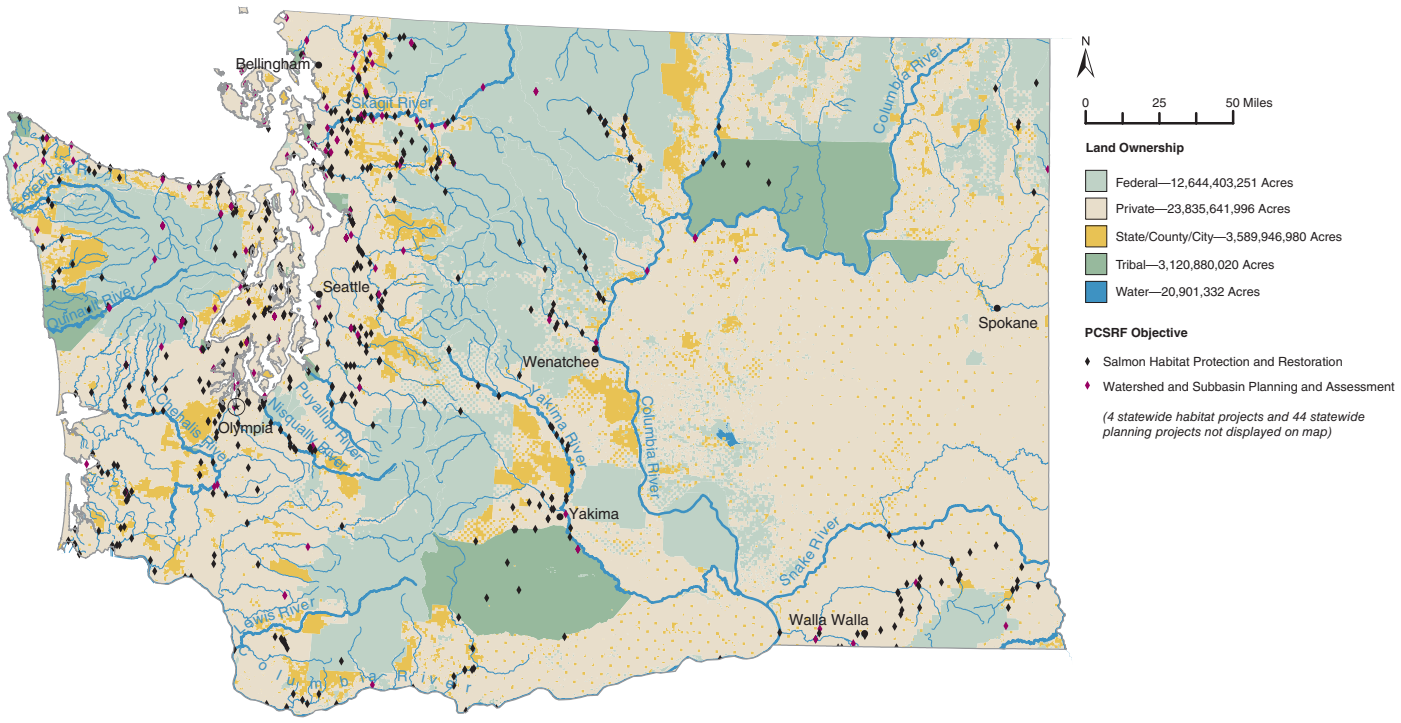

Before


After

Large Woody Debris Placement

In 2004, the Washington Salmon Recovery Funding Board (SRFB) committed PCSRF funds toward instream habitat restoration within Higgins Creek and side channel restoration along the Nooksack River. Both projects involved placing large woody debris (e.g., logs) in specific places along the watershed. Because of past logging, both watersheds lacked natural accumulation areas for large fallen trees. The replacement of large woody debris improves salmon habitat by serving as shelter for rearing juveniles and regulating stream temperatures. Crews placed 300 to 400 large trees in 30 to 40 sites along Higgins Creek and 200 trees along the Nooksack River. The large trees were transported using helicopters and were specifically placed in areas along the water courses where woody debris would naturally accumulate. The improved habitat conditions will contribute to the successful rearing of juvenile coho salmon, pink salmon, and steelhead inhabiting Higgins Creek and the Nooksack River.

Exhibit 4-3: Location of State and Tribal PCSRF Projects in Washington



Oregon

The State of Oregon combines PCSRF funds, state lottery funds, and other resources to support salmon conservation and restoration projects in areas where salmon are threatened or endangered. Because of requirements in Oregon state law, the majority of state salmon recovery funding must be allocated to habitat projects. Oregon has therefore used most of its PCSRF allocation to support other activities critical to the success of salmon recovery, such as support for watershed councils; watershed assessments; and monitoring of fish populations, habitat conditions, and the effectiveness of restoration activities.

Oregon has committed about $58 million in PCSRF funds and about $82 million in matching state funds for salmon recovery efforts as of February 2005. Exhibit 4-4 shows the distribution of funds in Oregon.

Oregon distributes PCSRF and state salmon recovery funds through a competitive process that is initiated twice a year. Each cycle takes approximately 21 weeks (see Exhibit 4-5).

Oregon has reported the following watershed restoration outcomes from 1995 to 2003:[6]

- Restored 2,730 miles of riparian habitat.
- Decommissioned and closed 2,045 miles of roads to reduce sedimentation in streams.
- Improved 1,871 stream crossings for fish.
- Made 2,558 miles of habitat accessible to fish through stream crossing improvements.
- Retired 90 dams.

PCSRF (and matching state funds, in particular) support the following salmon recovery activities in Oregon:

- Treat 1,608 stream miles to improve habitat conditions for salmon.
- Remove 511 fish passage blockages.
- Restore 6,907 acres of wetlands and create 1,869 acres of artificial wetlands to improve habitat conditions for salmon.
- Conduct 53 limiting factor assessments for salmon-bearing watersheds.
- Monitor 1,169 stream miles of salmon habitat.

The locations of state and tribal PCSRF projects in Oregon are shown in Exhibit 4-6. More information about Oregon's salmon conservation and restoration efforts is available at http://oregon.gov/OWEB/.

[6] Oregon Watershed Enhancement Board, *Oregon Plan for Salmon and Watersheds: Biennial Report 2003-05 Synopsis*, 2005, available at http://oregon.gov/OWEB/docs/pubs/BiennialReport_2003-2005_Synopsis.pdf.

Exhibit 4-4: Oregon's Distribution of PCSRF and State Funds, FY 2000–2004

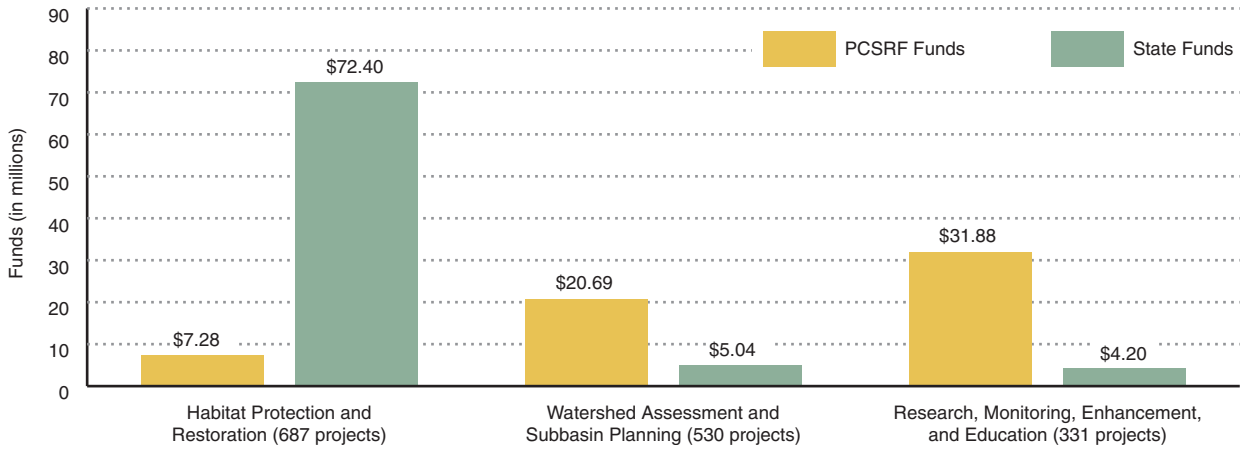


Exhibit 4-5: Oregon PCSRF Funds Distribution Timeline

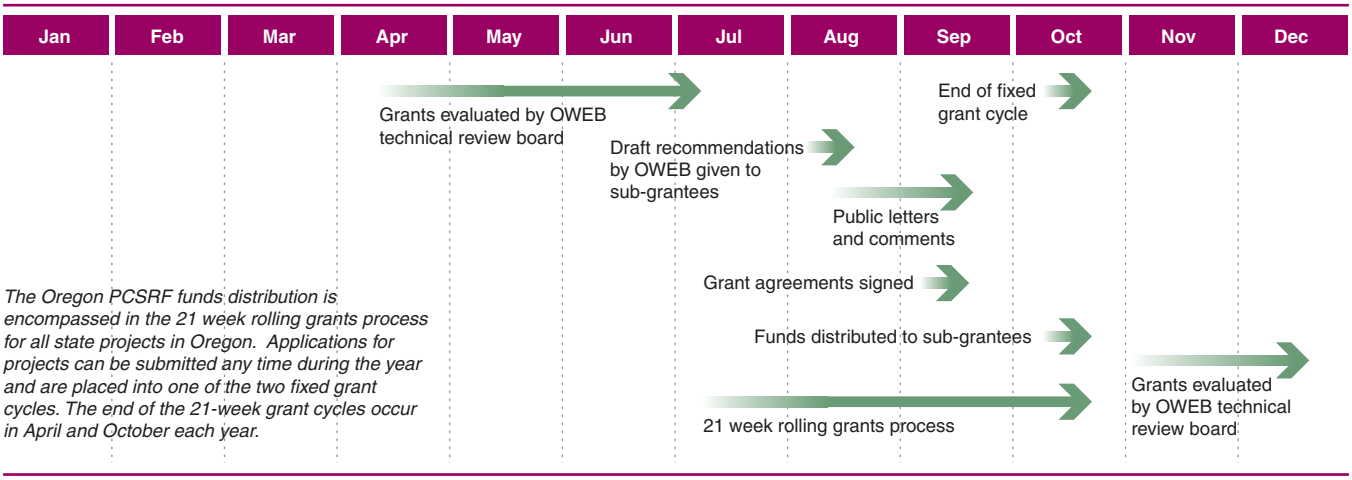
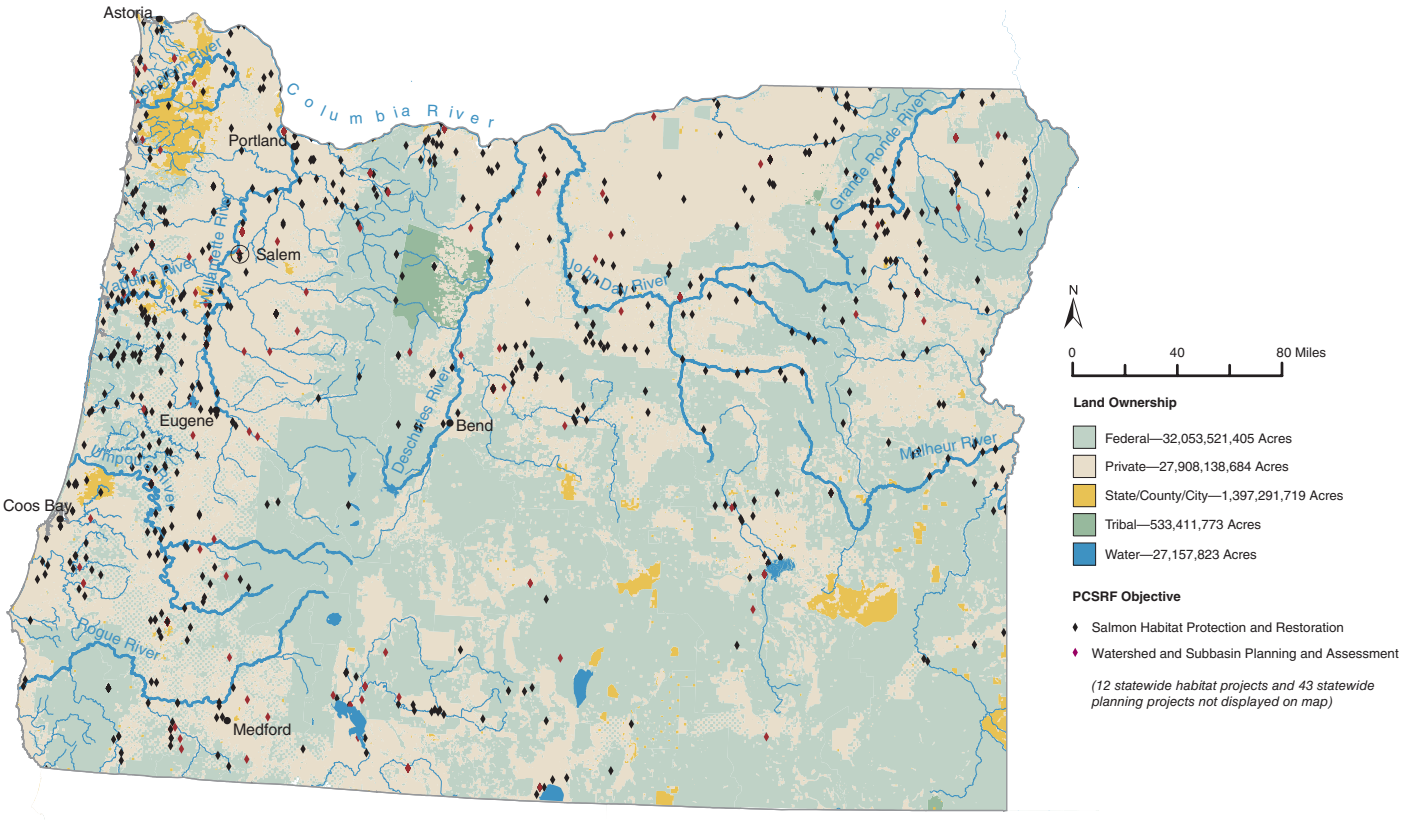


Exhibit 4-6: Location of State and Tribal PCSRF Projects in Oregon



Culvert Replacement

In 2003, the Oregon Watershed Enhancement Board (OWEB) allocated PCSRF funds towards repairing the Cedar Creek/Gilchrist Road stream crossing. Two old 72" corrugated metal culverts posed as barriers to salmon under normal and low flow conditions. The unsuitable metal pipes were replaced with an open-bottom, concrete box structure. The new structure is designed to pass the 100-year flood requirement, reduce water velocity, and allow debris to pass, thereby forming a natural streambed. Installing this new fish passage opened 18.16 miles of spawning and rearing habitat for coho salmon, steelhead, and cutthroat trout.

Before

After

California

The State of California invests the majority of PCSRF and state salmon recovery funds in projects to protect and restore salmon habitat in coastal areas of California. Approximately $51 million of California's PCSRF allocation from FY 2000–2003 and $39 million in state funds have been committed to salmon conservation and restoration activities (see Exhibit 4-7).

Because California's subgrant distribution process does not end until June of the year following receipt of PCSRF funds, FY 2004 funds had not been committed to projects as of February 2005. Exhibit 4-8 depicts the process used for California's allocation of PCSRF and state funds. Between FY 2000 and 2003, over 1,700 project proposals were received and 801 proposals were funded.

Since 1981, when California initiated its Fisheries Restoration Grant Program, more than 400 projects to improve instream fish habitat; more than 350 projects to address diversions to fish migration; more than 300 projects to reduce sedimentation in streams; and more than 550 projects to evaluate watersheds and plan responses, rear anadromous fish, educate, and restore riparian habitat have been supported.[7]

Through PCSRF-supported projects for FY 2000–2003 alone, California is conducting the following salmon conservation and restoration activities:

[7] California Department of Fish and Game, *California Coastal Salmon and Steelhead Restoration* (Sacramento: California Department of Fish and Game, undated), p. 3.


Before


After

Culvert Replacement

In summer 2001, the Humboldt County Public Works Department used PCSRF and other funds to replace the Lindsay Creek culvert at Murray Road with a 20-foot, bottomless arch culvert to provide fish passage for adult and juvenile fish and to comply with the 100-year flood requirement. The old culvert created a water velocity barrier to all juvenile salmonids and a temporary barrier to migrating adults. There was also over 3,600 cubic yards of sediment overlying the culvert that could have washed downstream if the culvert were overtopped from flooding.

The new crossing contains a natural bottom that allows the channel to flow through the crossing without any jumps. The 10-foot scour pool formerly at the culvert outlet is now a gravel bar with grasses, berries, and willows stabilizing the banks and re-establishing fish habitat along the channel.

Lindsay Creek, a tributary of the Mad River, is a priority watershed for recovery of Pacific Salmon. It is one of a the few streams in Northern California with four migrating salmonid species, including Chinook and coho salmon, steelhead, and coastal cutthroat trout. Over seven miles of fish habitat has been restored in the watershed by the six culvert barriers replaced since 2001.

- Restore about 300 stream miles of salmon habitat.
- Remove or upgrade 2,772 blockages to improve fish passage.
- Open about 42 miles of stream habitat for salmon through fish passage projects.
- Install or upgrade 67 fish screens to prevent salmon from entering areas with unsuitable habitat (all completed).
- Protect about 25,245 acres of habitat through land acquisition.
- Conduct 20 limiting factor assessments for salmon-bearing watersheds.
- Monitor about 240 stream miles of salmon habitat.

Exhibit 4-9 shows the distribution of projects funded by PCSRF and state matching funds in California. More information about California's salmon recovery efforts is available at http://www.dfg.ca.gov/nafwb/fishgrant.html.

Exhibit 4-7: California's Distribution of PCSRF and State Funds, FY 2000–2003*

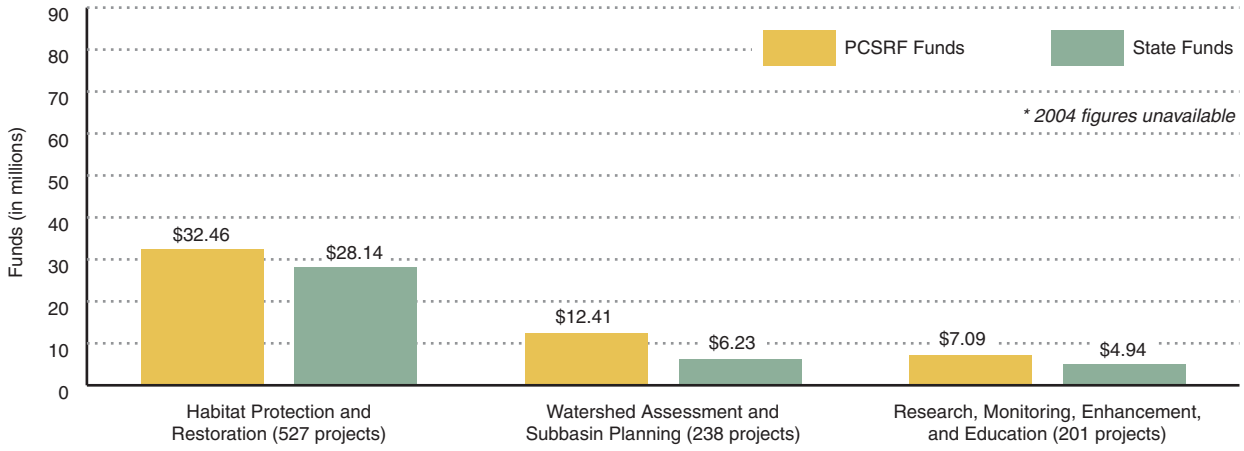


Exhibit 4-8: California PCSRF Funds Distribution Timeline

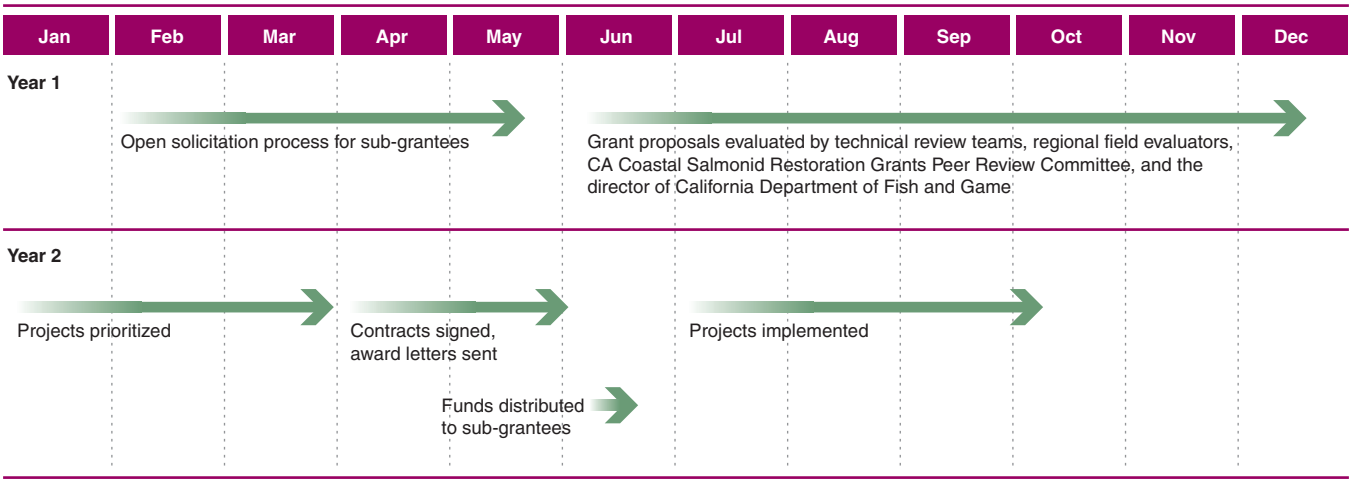
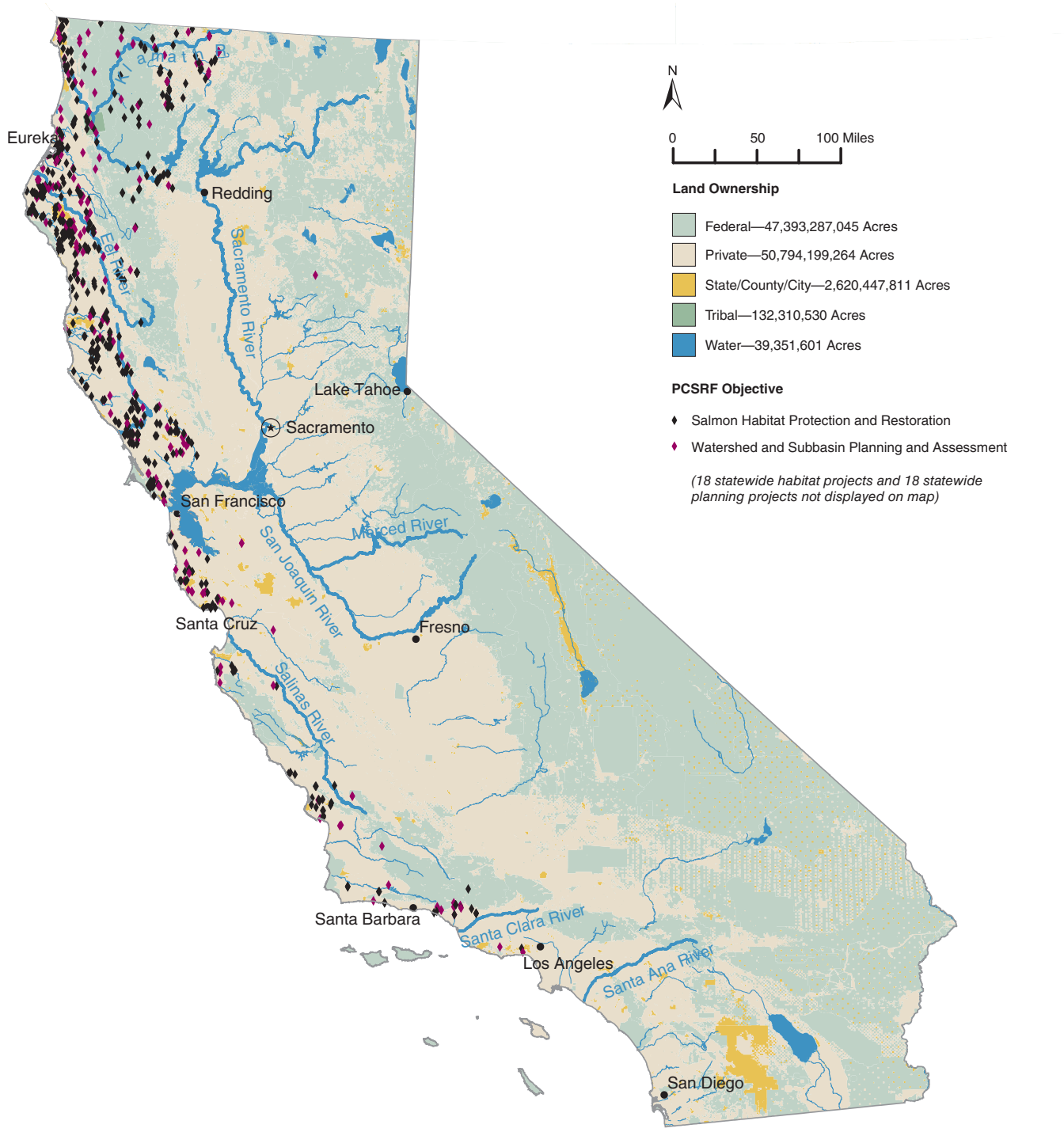


Exhibit 4-9: Location of State and Tribal PCSRF Projects in California



Idaho

Idaho first received PCSRF funds in FY 2004. Of the $4.73 million in PCSRF funds Idaho committed, 92 percent has been directed to habitat restoration efforts. The remainder of Idaho's PCSRF funding has supported research, monitoring, enhancement, and education projects (6 percent) and watershed assessment and sub-basin planning projects (2 percent). State matching funds have totaled $2.1 million.

In its first grant cycle, Idaho solicited proposals for salmon recovery projects in July and August 2004 and awarded grants in September 2004. In future years, Idaho plans to solicit grant applications in March and award funds to projects by August (Exhibit 4-10).

Idaho's FY 2004 PCSRF and state funds are being used to support the following salmon conservation and restoration activities:

- Restore approximately 64 stream miles of salmon habitat.
- Remove 28 blockages to improve fish passage and open 6 miles of stream habitat through fish passage projects.
- Treat 1,159 acres of upland habitat to improve conditions for salmon.
- Protect 1,800 acres and about 16 miles of stream bank habitat for salmon through land acquisition.

The distribution of projects in Idaho is shown in Exhibit 4-11. More information about Idaho's salmon recovery efforts is available at http://osc.idaho.gov/list/salmon_steelhead.html.

Exhibit 4-10: Idaho FY 2004 and FY 2005 (Proposed) Funding Distribution Timeline

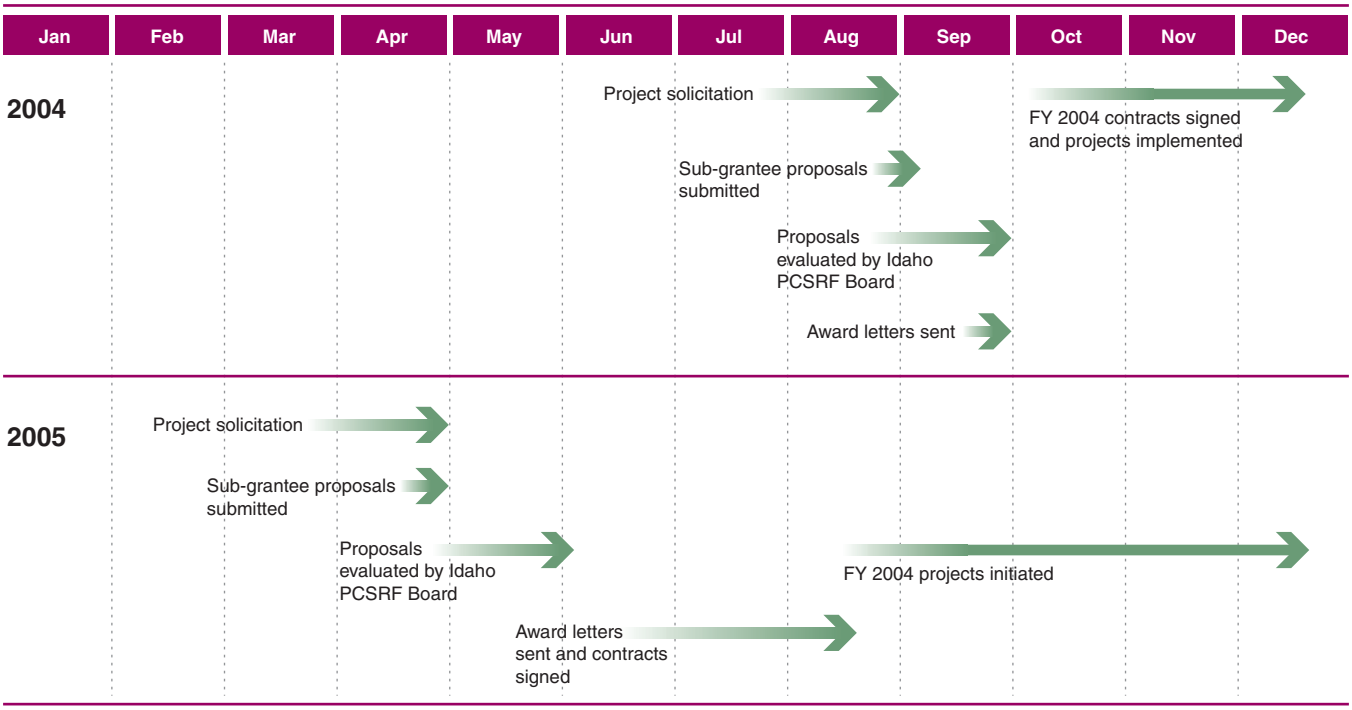
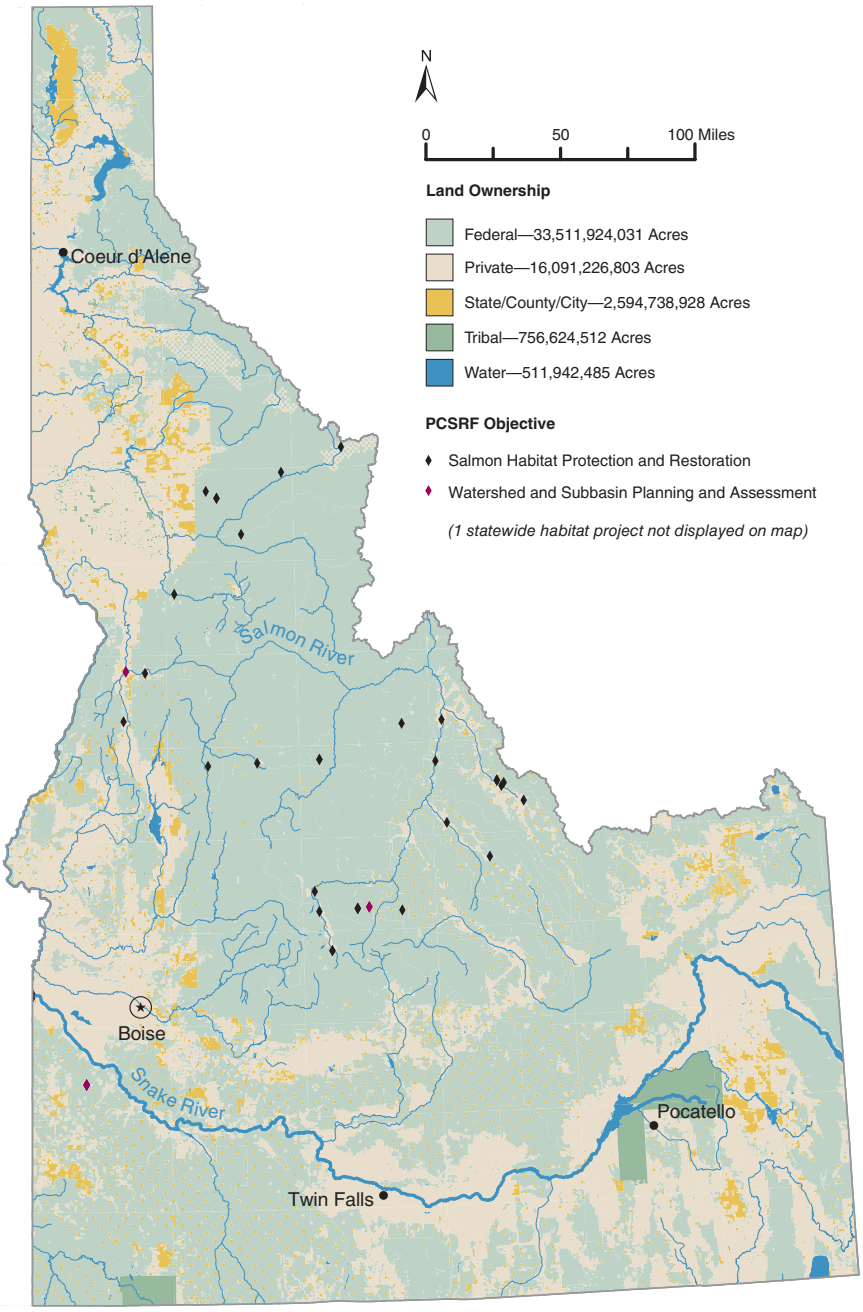


Exhibit 4-11: Location of State and Tribal PCSRF Projects in Idaho



Livestock Exclusion Fencing

A priority for PCSRF activities in central Idaho is building long-term collaborative relationships with private landowners to accomplish salmon restoration and conservation efforts in the upper Salmon River basin. Roughly 90 percent of the salmon spawning within this watershed takes place on privately owned property. The Lemhi River, in the upper Salmon River basin, provides critical habitat for migration, rearing, and spawning for Chinook salmon and steelhead. The first Idaho PCSRF project, completed in early January 2005, was the construction of a new 1,670-foot jack pole Cottom Lane fence along the Lemhi River. The fence replaced a dilapidated structure that no longer effectively excluded grazing livestock from important riparian habitat. The Lemhi Soil and Water Conservation District worked with local landowners to assemble a 30-percent cost share to match the PCSRF funds for building the new fence. The Cottom Lane fence protects a reach of the Lemhi River that is one of the primary spawning and rearing areas for the Chinook salmon and steelhead in central Idaho. A prime objective for Idaho's PCSRF activities is to establish projects on the ground as efficiently and promptly as possible. From the date of the project award notification, through contracting and permitting, to completion of fence construction, the Cottom Lane fence was on the ground in less than 5 months.

Before

After

Alaska

Alaska has successfully maintained its sustainable fisheries, and therefore has no ESA-listed salmon stocks. The majority of Alaska's PCSRF funds and all of its state matching funds have been focused on watershed and other habitat assessments, salmon and salmon industry enhancement, research and assessment projects for all five species of Pacific salmon, support for watershed councils, and education projects continuing Alaska's efforts to prevent ESA listings of salmon (see Exhibit 4-12). PCSRF funds have also been used to address the effects of harvest restrictions resulting from the 1999 Pacific Salmon Treaty, a salmon management agreement between the United States and Canada. Educating and maintaining an engaged constituency for salmon in Alaska has been—and remains—a critical factor in Alaska's ability to successfully advocate for salmon conservation and sustainability.

Much of Alaska's funding is allocated according to congressional earmarks, a trend that has increased steadily since the inception of the fund. No funds were earmarked in 2000, and in 2001 congressionally-designated PCSRF funds totaled 7 percent; in 2002, 38 percent; in 2003, 57 percent; and in 2004, 100 percent. The earmarked projects have included enhancement programs, restoration of fisheries and habitat in specified areas, science-based assessment and monitoring, and sustainable salmon initiatives.

Alaska distributes non-earmarked PCSRF funds and matching state funds through an interagency review process that occurs from August through March of the following year (see Exhibit 4-13).


Before


After

Southeast Alaska Community Watershed Stewardship

In Southeast Alaska, PCSRF funds have been directed toward the Southeast Community Watershed Stewardship Project (SCWSP). The project is administered by the Southeast Conference, a regional nonprofit organization representing the interests of Southeast Alaskans, communities, and businesses in resource management and economic development issues. SCWSP consists of six watershed councils in the Southeast Alaska communities of Haines, Juneau, Kasaan, Klawock, Skagway, and Yakutat.

In one example of the project's activities, in September 2003 the Takshanuk Watershed Council (TWC) in Haines replaced the Muskrat Creek culvert. The old, deteriorated culvert crossing at the Duck Marsh Road was an impediment to the migration of juvenile coho salmon. The new culvert significantly widened the passage underneath the road, thereby restoring stream flow and increasing accessibility to anadromous fish. Shortly after the completion of the project, salmon reoccupied the upstream habitat previously obstructed by the old culvert.

About $96 million of Alaska's PCSRF allocation and $8.2 million in state matching funds and other resources have been committed to projects as of February 2005. These funds support the following activities:

- Monitor 4,523 stream miles of salmon habitat.
- Establish 84 projects for stock management purposes.
- Produce and distribute 22,000 publications and develop a coordinated school curriculum on Alaska's wild sustainable salmon.
- Support six active watershed councils throughout Southeast Alaska.
- For management purposes, mark 153 million hatchery fish.
- Reach 13,680 people and 603 community groups and other entities through education and outreach events.

The distribution of projects in Alaska is shown in Exhibit 4-14. More information about Alaska's salmon recovery efforts is available at http://www.adfg.state.ak.us/special/sssf.php.

Exhibit 4-12: Alaska's Distribution of PCSRF and State Funds, FY 2000–2004

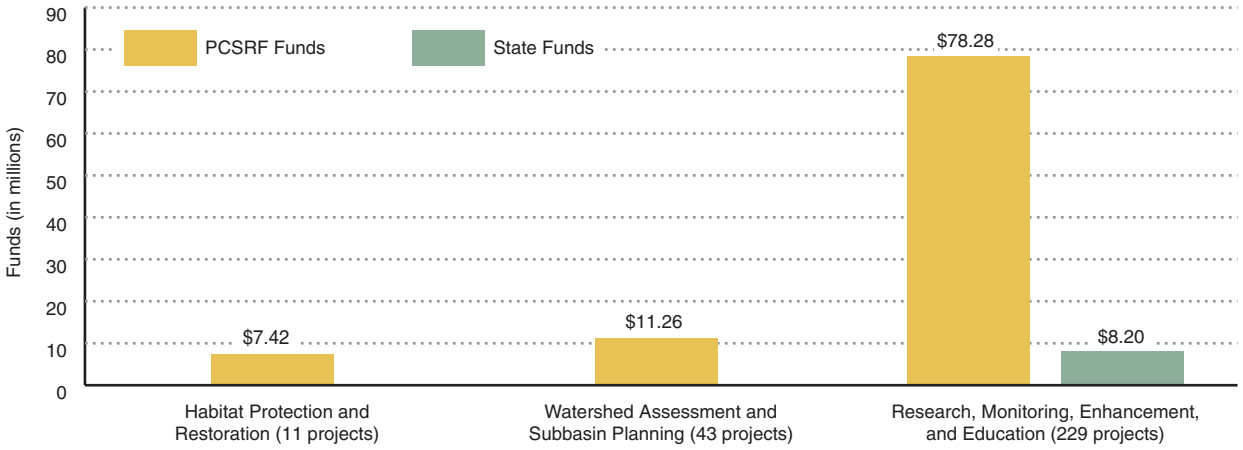


Exhibit 4-13: Alaska PCSRF Funds Distribution Timeline

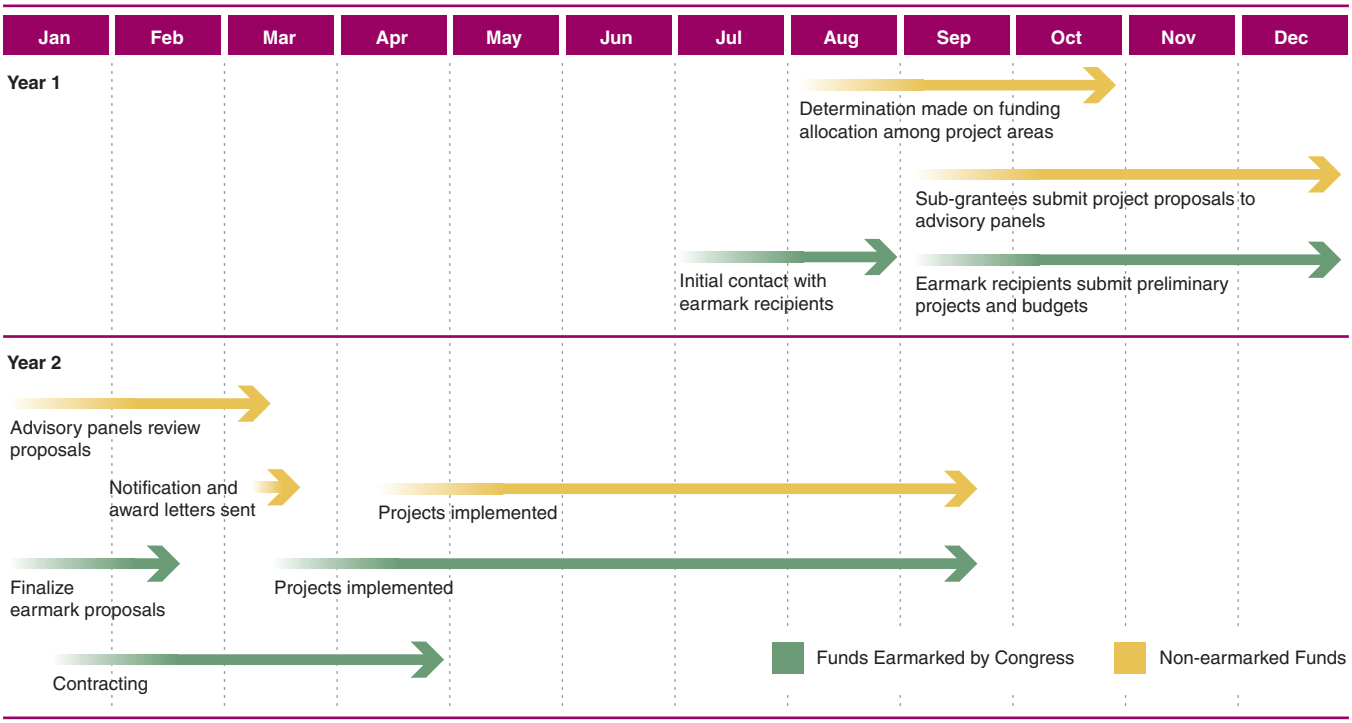
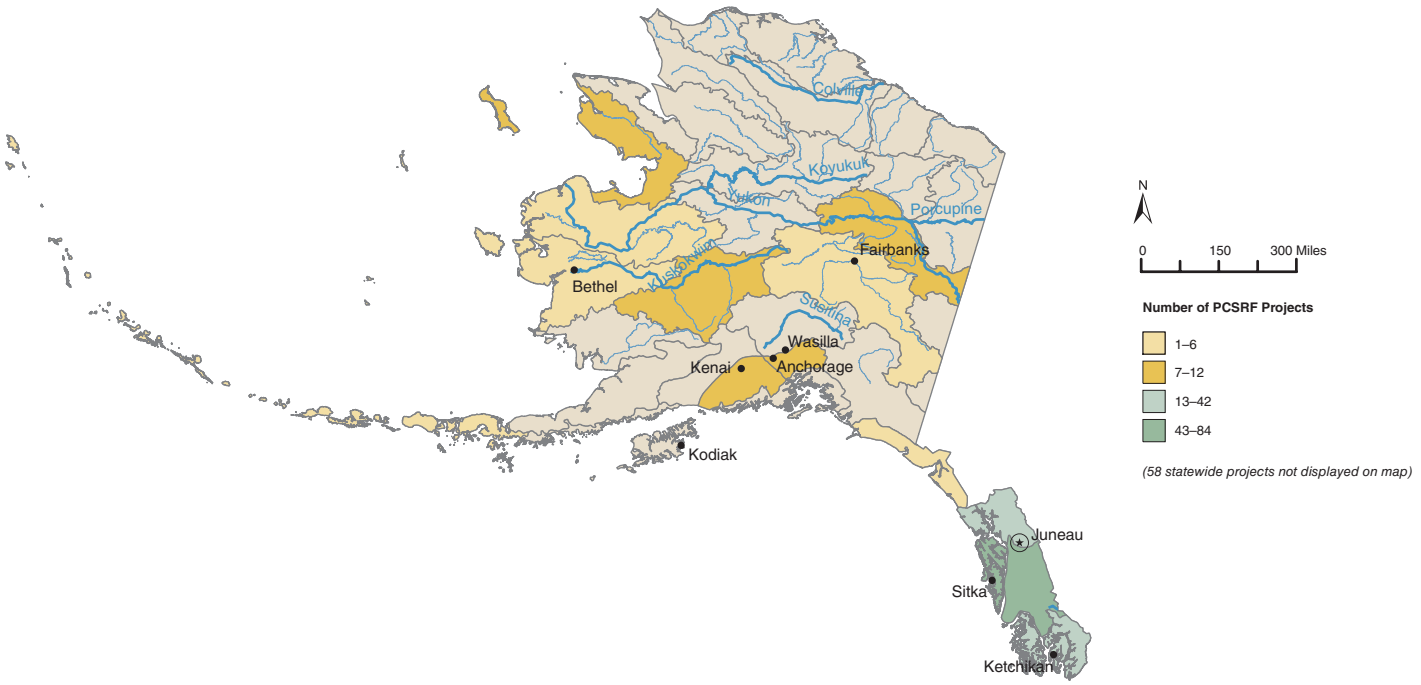


Exhibit 4-14: Distribution of State PCSRF Projects in Alaska



Columbia River Tribes

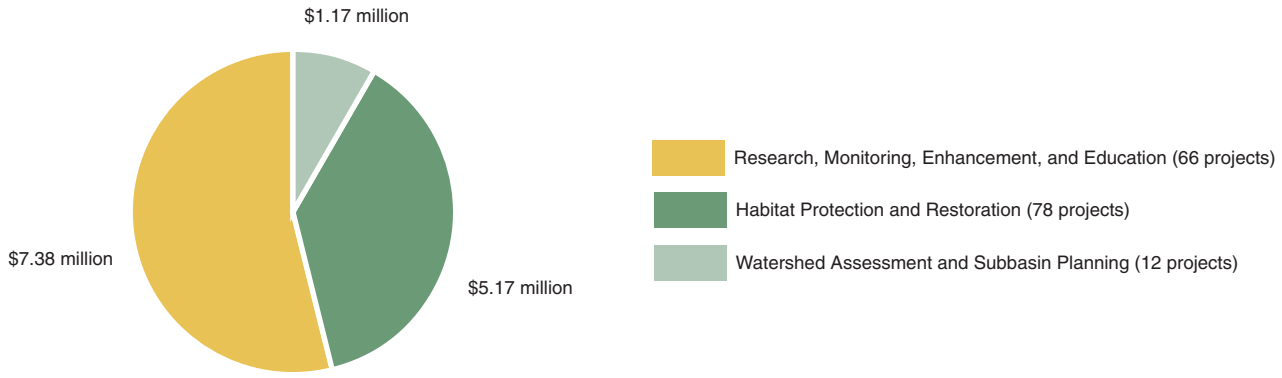
PCSRF provides funding to six Columbia River tribes or their Tribal Commission to support salmon recovery in the Columbia River basin. As of February 2005, these tribes had distributed $13.7 million in PCSRF funds, with the majority (53 percent) supporting research, monitoring, enhancement, and education projects in the Columbia River basin, and another 38 percent supporting habitat protection and restoration projects (see Exhibit 4-15).

The Columbia River Inter-Tribal Fish Commission (CRITFC) receives the majority of PCSRF funds for Columbia River tribes. CRITFC is a technical support and coordinating agency for the fisheries management policies of the Nez Perce Tribe, Confederated Tribes of the Umatilla Indian Reservation, Confederated Tribes of the Warm Springs Reservation, and Confederated Tribes and Bands of the Yakama Nation. NMFS also provides PCSRF funds directly to the Colville Confederated Tribes and the Shoshone-Bannock Tribes. The grant distribution process for the Columbia River tribes begins in June of the year following congressional appropriations and ends the following March (see Exhibit 4-16).

Columbia River tribes use PCSRF funds to support the following salmon recovery activities:

- Treat about 695 stream miles to improve habitat conditions for salmon.
- Remove 34 blockages to improve fish passage and thereby open 181 stream miles of habitat to salmon.
- Restore 200 miles of stream banks in riparian habitat projects.
- Protect 11,375 acres and about 45 stream miles of habitat through land acquisition.
- Mark about 1.18 million hatchery fish in efforts to supplement naturally spawning salmon stocks.
- Monitor 626 stream miles of salmon habitat.

Exhibit 4-15: Columbia River Tribes' Distribution of PCSRF Funds, FY 2000–2004



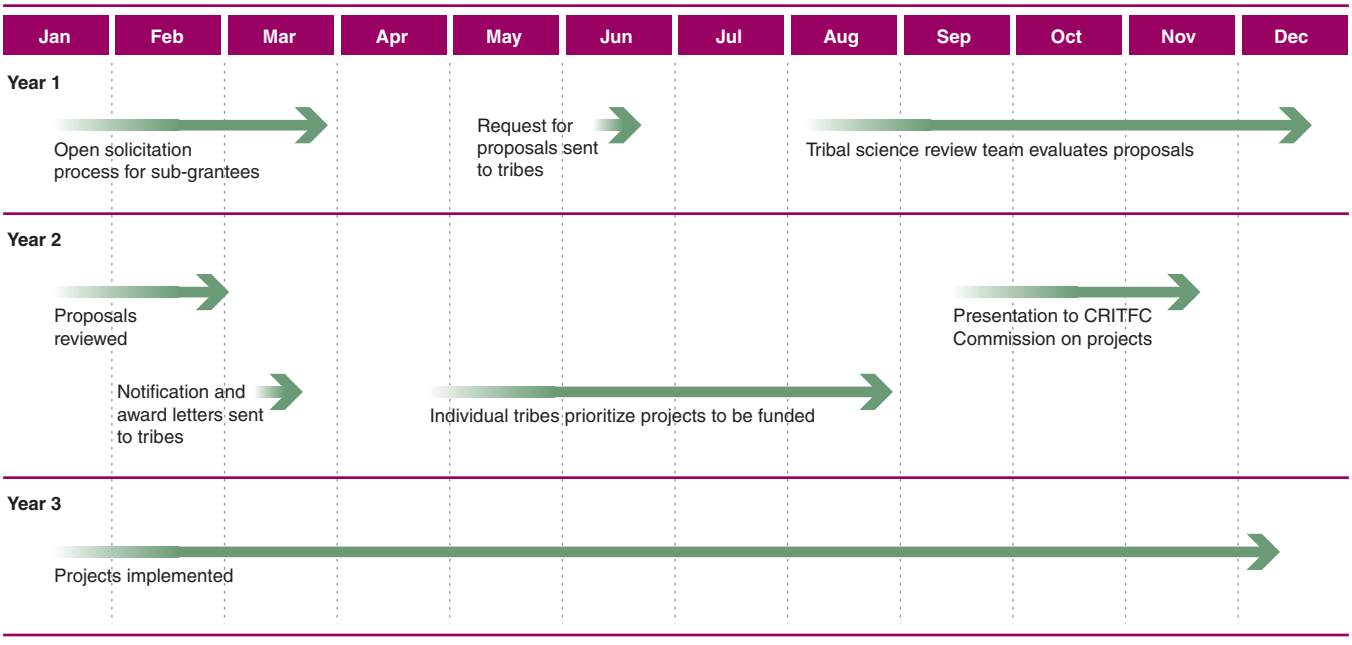

Before


After

Fish Passage Barrier Removal

The Confederated Tribes of the Warm Springs Reservation of Oregon (CTWSRO) within the Columbia River Inter-Tribal Fish Commission (CRITFC) directed PCSRF funds toward the Central Lateral Canal Fish Passage Barrier Removal project. The project, currently underway, is restoring adult and juvenile fish passage through fish screen removal and water quality treatments in Neal Creek. The project is also restoring natural instream flows in the East Fork of the Hood River. This PCSRF project is part of Phase I of the three-phase Central Lateral Canal project, a major irrigation system upgrade project that began in 1998 and is expected to be completed by the end of 2006. Neal Creek is located approximately 20 miles upstream of the Columbia River and is one of the most important mainstem tributaries to the Hood River in central Oregon. When completed, this project will restore the habitat and contribute to the survival of the coho salmon, steelhead, and cutthroat trout inhabiting the watershed.

Exhibit 4-16: CRITFC PCSRF Funds Distribution Timeline



Pacific Coastal Tribes

Tribes along the Pacific Coast in Washington, Oregon, and California have committed $33 million in PCSRF funds toward salmon conservation and recovery since 2000. Most of these funds (47 percent) have been distributed by tribal commissions in Puget Sound and the Klamath River basin for research, monitoring, enhancement, or outreach projects (see Exhibit 4-17). About 37 percent of these funds have supported tribal watershed assessments and planning projects along the Pacific Coast, with the remainder of the funds supporting habitat protection and restoration.

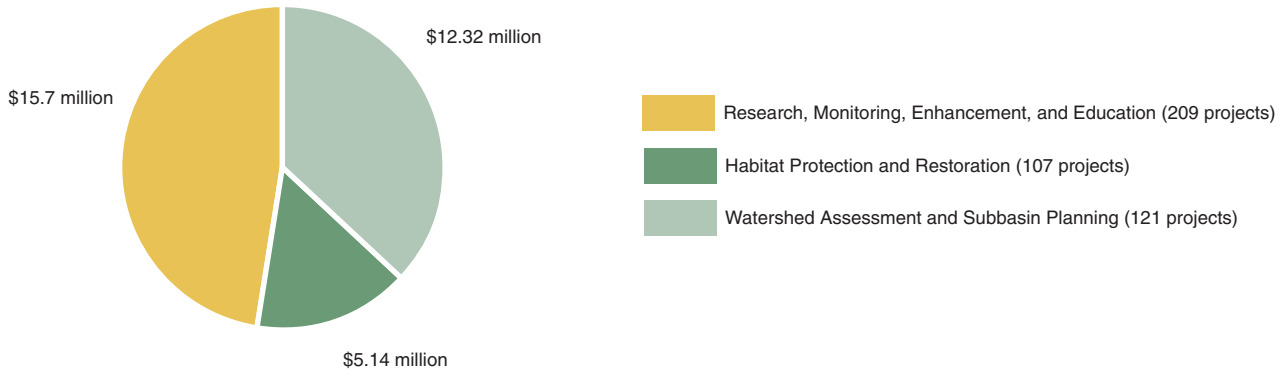
NMFS distributed PCSRF funds for Pacific coastal tribes to 29 tribes and/or their respective tribal commissions in Washington, Oregon, and California. The funding was distributed to: Northwest Indian Fisheries Commission (NWIFC) on behalf of 20 western Washington treaty Indian tribes; Klamath River Inter-Tribal Fisheries and Wildlife Commission (KRITFWC) on behalf of four Klamath River Basin tribes (Hoopa Valley Tribe, The Karuk Tribe of California, Yurok Tribe, and The Klamath Tribes); the Round Valley Indian tribes in the Eel River Basin in California; the Confederated Tribes of the Chehalis Reservation in Washington; the Coquille Indian Tribe in Oregon; the Confederated Tribes of Grand Ronde in Oregon; and the Confederated Tribes of the Siletz Indians of Oregon. (PCSRF funds were initially provided directly to the Yurok, Hoopa Valley, and Klamath Tribes; however, these tribes joined with the Karuk Tribe to have the KRITFWC obtain PCSRF funding on behalf of all four Klamath Basin tribes starting in FY 2001.)

The NWIFC is the western Washington inter-tribal organization created in 1974 to assist tribes party to U.S. v. Washington in conducting biologically sound fisheries and providing a unified voice on fisheries management and conservation issues. NWIFC member tribes receiving PCSRF funds are the Nisqually, Squaxin Island, Puyallup, Jamestown S'Klallam, Port Gamble S'Klallam, Lower Elwha Klallam, Skokomish, Swinomish, Sauk-Suiattle, Upper Skagit, Tulalip, Makah, Stillaguamish, Muckleshoot, Suquamish, Nooksack, Lummi, Hoh, Quinault, and Quileute tribes. NWIFC subgrants to member tribes are typically awarded in March of the year following the congressional appropriations to NOAA (see the timeline in Exhibit 4-18).

Pacific Coastal tribes are using FY 2000–2004 PCSRF funds to support the following activities benefiting salmon conservation and recovery:

- Treat about 131 stream miles of habitat in habitat restoration projects.
- Remove 38 fish passage blockages and thereby open about 12 stream miles of habitat to salmon.
- Acquire 188 acres of land to protect salmon habitat.
- Conduct 55 limiting factor assessments in salmon-bearing watersheds.
- Monitor 3,383 stream miles of salmon habitat.

Exhibit 4-17: Pacific Coastal Tribes' Distribution of PCSRF Funds, FY 2000–2004




Before


After

Side Channel and Floodplain Restoration

Swinomish and Sauk-Suiattle tribes restored one mile of unsuitable salmon rearing habitat in Bacon Creek in the Skagit River watershed in Washington. The deterioration of salmon habitat along Bacon Creek was a result of road development and alteration of the course of the river. The road construction led to a straightening of the riverbank and a loss of side channels along the river that are critical to salmon rearing. The PCSRF project for Bacon Creek included removing the road along the river, placing a new road farther from the water, and restoring the river's natural course. In addition to replacing the side channels along the river bank, the restoration work allowed Bacon Creek to spread across its natural flood plain to improve habitat in the stream's main stem.

Bacon Creek is extremely important for salmon, including Skagit River Chinook salmon, listed as "threatened" under the federal Endangered Species Act. Bacon Creek and Illabot Creek are the two most productive tributaries of the Skagit River. The Skagit River is home to the largest Chinook salmon run north of the Columbia River.

Exhibit 4-18: NWIFC PCSRF Funds Distribution Timeline

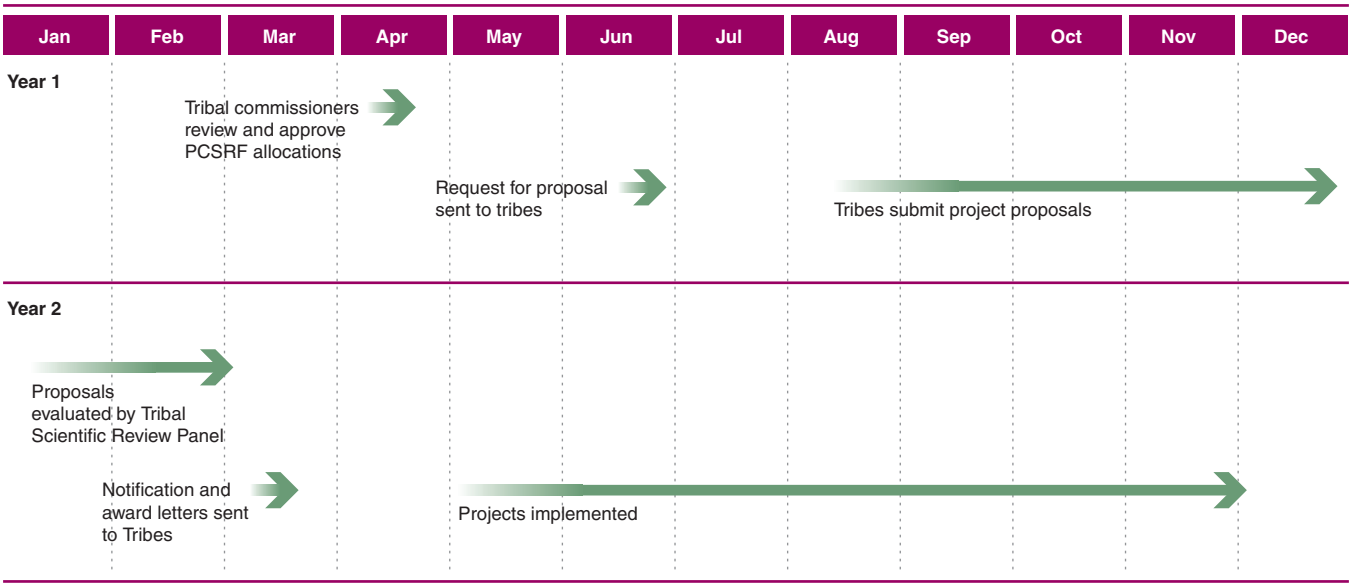
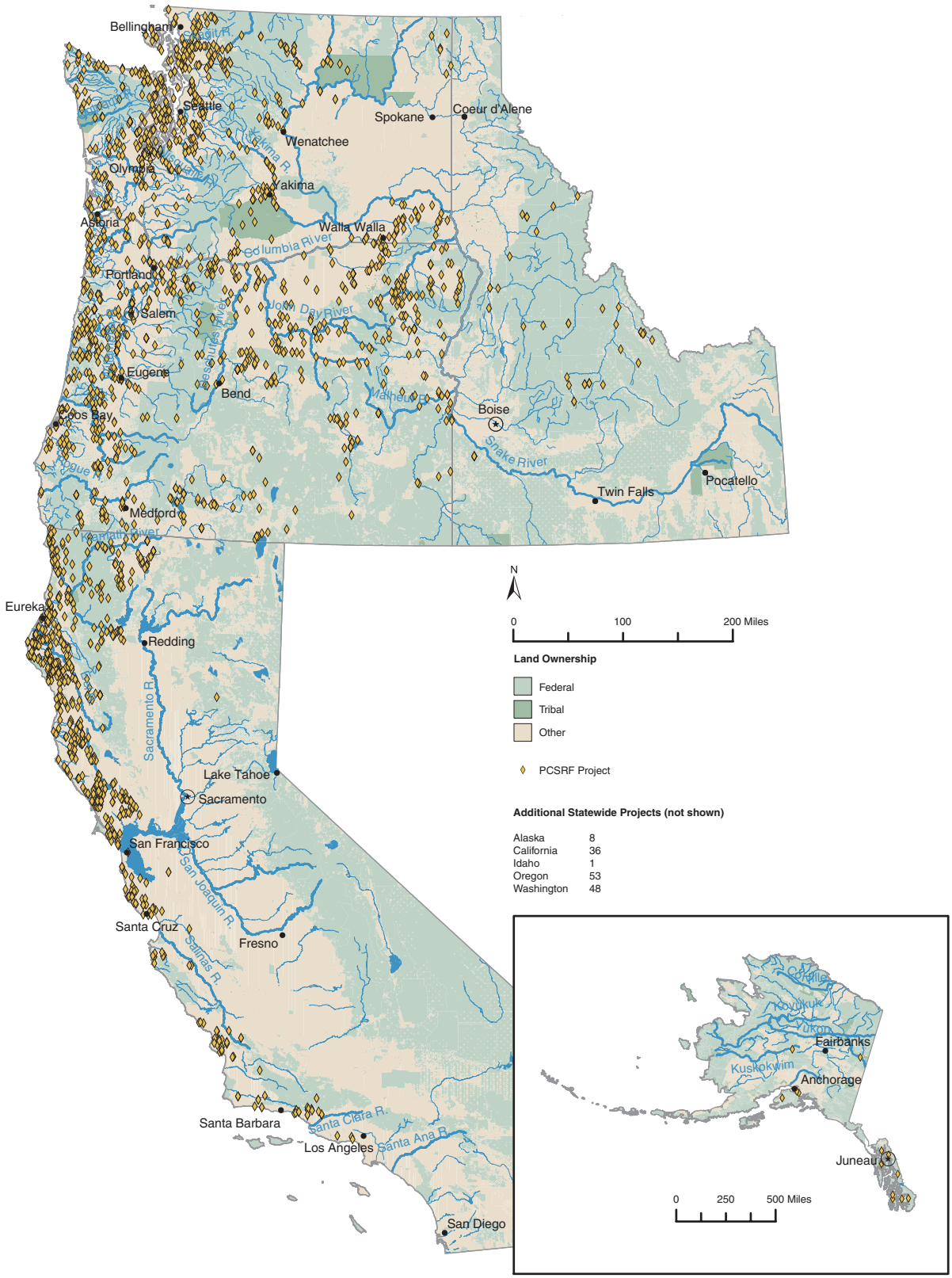


Exhibit 5-1: Distribution of PCSRF Projects Throughout the Region



Chapter 5: Conclusions

The life cycles of salmon are complex and the variables affecting their recovery and survival are many, but their needs for freshwater and estuarine habitat are relatively straightforward. They require ample cool, clean water in the migration corridor; gravel to build nests and lay eggs; shallow pools to provide rest stops along the way; and undisturbed shoreline and nearshore rearing habitat. Meeting these needs—and improving current conditions—is the goal of PCSRF.

PCSRF has provided funding support in accordance with congressional and administration direction since 2000. A total of $525 million has been appropriated to the program and subsequently distributed to the states and tribes in accordance with the federal appropriations acts. Exhibit 5-1 depicts the regional distribution of projects. Exhibit 5-2 shows the allocation of funds by state and tribal commission, including matching funds.

This report builds on prior-year efforts to develop and report on outputs and outcomes of PCSRF. States and tribes have worked with NMFS over the past few years to come to agreement on a set of performance measures with which to demonstrate progress in meeting the goals of salmon recovery. This report presents a set of performance goals and associated performance measures for the PCSRF program. Three major performance goals for PCSRF have been established and form the basis for measuring the results of the activities funded by PCSRF.

The PCSRF data show progress toward salmon restoration and conservation goals. Key activities include:

- Restoring riparian and instream habitat.
- Acquiring land to protect salmon habitat.
- Removing fish passage blockages to open habitat to salmon.
- Identifying ways to address factors limiting recovery.
- Monitoring salmon populations and habitat conditions.
- Developing better knowledge and strategies to manage salmon.

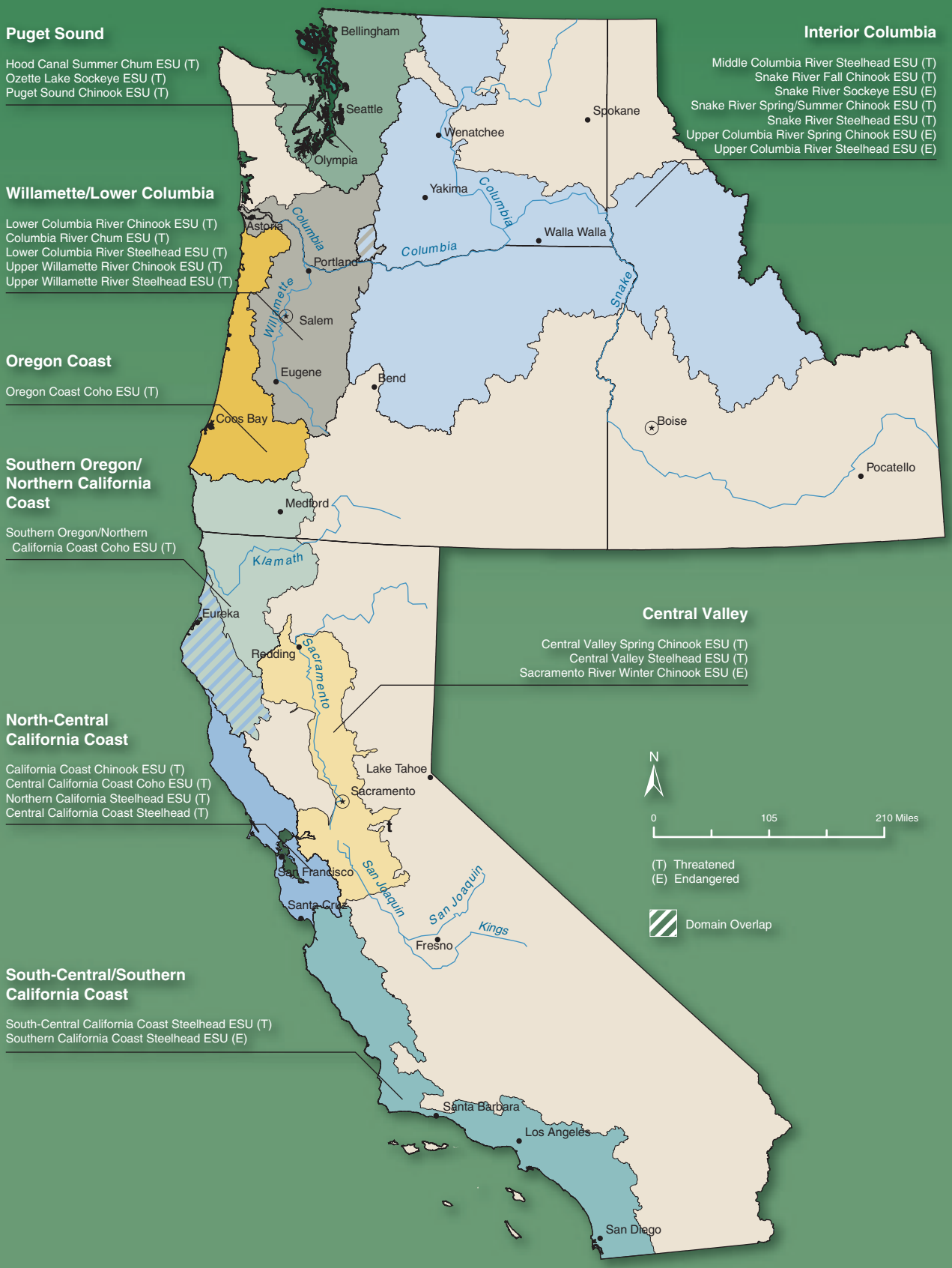
NMFS is fully committed to continuing to work with states and tribes to improve performance measurement and reporting for PCSRF, as the region continues to advance salmon recovery.

Exhibit 5-2: PCSRF and State Funds Committed by Category (in millions)

	Habitat Protection & Restoration (1,847 projects)	Watershed Assessment & Subbasin Planning (1,127 projects)	Research, Monitoring, Enhancement, & Education (1,059 projects)
Washington	$75.34	$28.79	$23.04
Oregon	$7.28	$20.69	$31.88
California	$32.46	$12.41	$7.09
Alaska	$7.42	$11.26	$80.13
Idaho	$4.37	$0.07	$0.29
Columbia River Tribes	$5.17	$1.17	$7.38
Pacific Coastal Tribes	$5.14	$12.32	$15.69
Total PCSRF Funds	$137.18	$86.71	$165.50
State Matching Funds	$145.45	$28.41	$19.81
Total PCSRF & State Funds	$282.63	$115.12	$185.31

This page intentionally left blank

Recovery Domains and Evolutionarily Significant Units




DEPARTMENT OF COMMERCE
UNITED STATES OF AMERICA